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ANALYSIS OF SINGLE-PROJECT PARTNERING

by

Peter W. Mueller

B.S., Civil Engineering, University of Utah

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Submitted to the Department of
Civil and Environmental Engineering in Partial
Fulfillment of the Requirements for the
Degree of

MASTER OF SCIENCE
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P. W. Mueller
Department of Civil and Environmental Engineering
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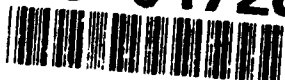
Certified by

Fred Moavenzadeh
Fred Moavenzadeh
Director, Center for Construction Research and Education
Thesis Supervisor

Accepted by

Ole S. Madsen
Ole S. Madsen
Chairman, Departmental Committee on Graduate Studies

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Submitted to the Department of Civil and Environmental Engineering on
22 December 1992 in partial fulfillment of the requirements for the
Degree of Master of Science in Civil Engineering at the
Massachusetts Institute of Technology.

ABSTRACT

This thesis analyzes the concept of Single-Project Partnering as applied in the public sector by three organizations. The United States Army Corps of Engineers, the Arizona Department of Transportation and the Massachusetts Highway Department on the Boston Central Artery/Tunnel Project.

The Partnering concept was developed in the private sector and has been applied to both the manufacturing and construction industries. In the private sector the Construction Industry Institute defines Partnering's key elements as trust, long-term commitment and shared vision between two or more organizations. Under this approach the organizations develop a close relationship and pool their resources to enhance their efficiency and improve productivity.

In 1988 the U.S. Army Corps of Engineers first applied a public sector hybrid of this concept to the delivery of construction services while meeting the restrictions of public sector laws and regulations. The Corps' motivation was to implement a program that could improve the delivery of construction projects in a non-adversarial environment and mitigate the causes of epic increases in disputes and litigation within the construction industry.

This thesis analyzes the public sector construction delivery process using the Dispute Resolution System Model developed by Ury, Brett, & Goldberg. This study addresses the problems experienced by the construction industry from operating in a highly adversarial environment and analyzes the ability of public sector Partnering process to mitigate these problems. This analysis includes identification of the problems in the construction industry; introduction of the Partnering concept; analysis of the Corps model using the Systems approach; presentation of a series of case studies of the process; identification of benefits attributed to the process; analysis of how and why Partnering works; identification of some weaknesses and possible process improvements; and concludes with an estimate of the role of Partnering into the future.

Thesis Supervisor: Dr. Fred Moavenzadeh

Title: Director, Center for Construction Research and Education.

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AUTHOR

The author, Peter W. Mueller, is a Captain in the U.S. Army Corps of Engineers. He was born in Lafayette, Indiana in 1960. Following his graduation from the University of Utah in 1982 he received his Army commission through Officer Candidate School at Fort Benning, Georgia. He has served as a platoon leader, Aide-de-Camp, brigade engineer and company commander in combat engineer and infantry units in Europe, the United States and in Southwest Asia during the War in the Persian Gulf. He is enrolled as an Engineer-in-Training by the state of Utah. He is married to the former Suzanne Marie Pelletier.

TABLE OF CONTENTS

	Page
ABSTRACT.....	2
ACKNOWLEDGEMENTS.....	3
AUTHOR.....	3
TABLE OF CONTENTS.....	4
 1. INTRODUCTION.....	 8
1.1 Construction Industry Deficiencies.....	8
1.2 Construction Industry Initiatives.....	10
1.3 The U.S. Army Corps of Engineers.....	11
1.4 Corps of Engineers Initiatives.....	13
1.5 Partnering.....	15
1.6 Thesis Objectives and Analysis Strategy.....	16
 2. CONSTRUCTION INDUSTRY PROBLEM ANALYSIS.....	 19
2.1 The Traditional Delivery Process.....	20
2.1.1 Effects of the Traditional Process.....	21
2.1.2 Causes of the Adversarial Relationship.....	23
2.2 Attitudinal Issues.....	24
2.2.1 The Win/Lose Atmosphere.....	25
2.2.2 The Litigiousness of Society.....	26
2.2.3 Conflicting Cultures.....	29
2.2.4 Competing Goals.....	30
2.3 Construction Risks.....	31
2.3.1 Risks Due to Changes and Delays.....	33
2.3.2 Risks Due to Unknown Partners.....	33
2.3.3 Risks Through Contracts.....	35
2.3.3.1 Contract Type.....	35
2.3.3.2 Award Methods.....	37
2.3.3.3 Contract Language.....	38
2.3.5 Economic Impacts.....	40
2.4 Summary Analysis.....	42

3.	PARTNERING.....	46
3.1	The Partnering Concept.....	47
3.2	Partnering Models.....	50
3.2.1	Pure Partnering.....	50
3.2.2	Limited Source Partnering.....	54
3.2.3	Public Sector Partnering.....	56
3.3	The Corps of Engineers Model.....	58
3.6.1	The Corps Partnering Process.....	59
3.6.2	The Partnering Workshop.....	64
3.4	Analysis of the Public Sector Model.....	69
3.4.1	Environmental Issues.....	70
3.4.2	Dispute Resolution Procedure.....	74
3.4.3	Motivation, Skills and Resources.....	78
3.5	Chapter Summary.....	80
4.	PUBLIC SECTOR PARTNERING APPLICATIONS.....	82
4.1	U.S. Army Corps of Engineers.....	83
4.1.1	Oliver Lock and Dam.....	84
4.1.2	Test Operations Control Center.....	91
4.1.3	Bonneville Lock and Dam Project.....	95
4.1.3.1	Diaphragm Wall Project.....	96
4.1.3.2	Well Project.....	98
4.1.3.3	Lock Construction Project.....	99
4.1.4	J-6 Rocket Test Facility.....	102
4.1.5	Corps Experiences.....	105
4.2	The Arizona Department of Transportation.....	106
4.2.1	Arizona Route 87.....	107
4.2.2	Arizona DOT Project Status.....	110
4.3	The Massachussetts Highway Department.....	112
4.3.1	Initiating Partnering.....	117
4.3.2	Central Artery/Tunnel Partnering Structure.....	119
4.3.3	Work Package C04A2, Third Harbor Tunnel, West End..	122
4.3.4	Work Package C07A1, Third Harbor Tunnel, East End..	125
4.3.5	Project Status.....	128
4.4	Partnered Project Summary.....	130

5. PARTNERING ANALYSIS.....	132
5.1 Benefits of Partnering.....	133
5.1.1 Project Delivery Time.....	134
5.1.2 Project Costs.....	136
5.1.2.1 Delivery Costs.....	136
5.1.2.2 Reducing the Hassle Fee.....	138
5.1.3 Value Engineering/Constructability.....	139
5.1.4 Project Safety.....	141
5.1.5 Reduced Bureaucracy.....	142
5.1.6 No Litigation.....	143
5.1.7 Benefits Summary.....	144
5.2 Why Partnering Works.....	146
5.2.1 The Change in Attitude to Win/Win.....	147
5.2.1.1 Commitment from Top Leadership.....	147
5.2.1.2 The Effect of the Partnering Workshop.....	150
5.2.1.3 Partnering Agreement/Mission Statement.....	154
5.2.2 Risk Reduction Through Partnering.....	156
5.2.2.1 Project Focus.....	157
5.2.2.2 Decision Responsibility.....	158
5.2.2.3 The Problem Resolution Model.....	161
5.2.2.4 The Maintenance Program.....	167
5.3 Partnering Barriers.....	169
5.3.1 Unrealistic Expectations.....	170
5.3.2 Institutional Resistance.....	172
5.3.3 Stakeholder Culture Clash.....	174
5.3.4 Stakeholder Sophistication.....	177
5.3.5 Personnel Turbulence.....	179
5.3.6 Legal Implications.....	180
5.4 Analysis Summary.....	183
6. THE FUTURE OF PARTNERING.....	186
6.1 Alternatives for Improvement.....	186
6.1.1 Improved Risk Sharing Through Contracts.....	187
6.1.2 Incentives Programs.....	190
6.1.3 The Rolling Partnership.....	192
6.1.4 Project Goal Focus Sessions.....	193

6.1.5	Partnering with Design/Build Contracts.....	194
6.2	The Future Role of Partnering.....	198
6.2.1	Lowering Construction Industry Costs.....	198
6.2.2	Increased Innovation in Construction.....	199
6.2.3	New Role for the Construction Manager.....	200
6.2.4	Infrastructure Rehabilitation.....	201
6.2.5	Environmental Remediation Projects.....	202
6.2.6	Lessons for the Private Sector.....	203
6.3	Future Studies.....	205
6.4	Thesis Conclusion.....	205
BIBLIOGRAPHY.....		209
APPENDICES.....		215

INTRODUCTION

1.1 Construction Industry Deficiencies.

The construction industry in the United States accounts for ten percent of the Nation's Gross National Product. Thus inefficiencies in this industry can result in great financial losses. A critical deficiency within the industry today is a severe adversarial relationship between the stakeholders, owner-designer-constructor, in the construction process. "There's an adversarial illness which has infected the construction industry. Confrontation, disputes and litigation have become common. They are messing up a lot of projects and costing everybody a lot of money."¹

The amount of litigation within the industry has reached crisis proportions. There are numerous statistics that support this claim. The American Bar Association's forum on the Construction Industry, claiming to include every construction lawyer in the country, grew from 500 to 5,500 member lawyers in ten years.² In 1989 the American Arbitration Association identified cases for construction disputes were increasing at 10% each year.³

¹Groton, James, P. "Current Status of ADR in the Industry." Presentation given at 1991 CII Conference: Forum Discussion on ADR. Monterey, CA. 1991, p. 1.

²Ibid, p. 4.

³Schriener, Judy; McManamy, Rob; Setzer, Steven. "Lawyers: Whose Side are They on?" *Engineer News Record*. March 16, 1989, p. 22.

In 1991 the newly formed Dispute Avoidance and Resolution Construction Task Force (DART) identified "In the public sector alone, excessive litigation is acknowledged to be a major problem, adding unbudgeted hundreds of millions to the public debt of local and state governments as well as the federal government."⁴ The experiences of the U.S. Army Corps of Engineers, one of the Nations largest public sector construction agencies averaging approximately \$10 billion of construction annually⁵, reflect this claim. By 1991 contract claims within the Corps had increased by 200% over a decade and pending claims now average over \$1 billion annually.⁶

"The legal and engineering efforts required to conduct this amount of litigation saps the vitality of all organizations involved."⁷ Hiring outside legal help to handle these disputes is expensive. The AAA identified that typical costs are \$75-200/hr. Adjudicating disputes through litigation requires massive efforts by all parties involved in the process. It includes attorneys, expert witnesses, judges, and employees from both sides. This adversely effects the efficiency and productivity of the owner and contractor

⁴Dispute Avoidance and Resolution Construction Industry Task Force. *DART Business Plan*. Sept, '91, p.4.

⁵Ichniowski, Tom, "Taking the Corps by Storm." *Engineer News Record*, October 19, 1992, p. 17.

⁶Cowan, Charles, E. "A Strategy for Partnering in the Public Sector." *Preparing for Construction in the 21st Century*. Proceedings of Construction Congress '91, ASCE, 1991, p. 721.

⁷Brubaker, William. "Partnering Benefits; A Headquarters Department of the Army Perspective." *Preparing for Construction in the 21st Century*. Proceedings of Construction Congress '91, ASCE, 1991, p. 735.

organizations. It perpetuates the adversarial relations that generate the disputes in the first place.

The high degree of claims and litigation in construction are only one symptom of the major adversarial relations existing in the industry. Today other symptoms include rising construction costs, project schedule growth and poorer quality products. The primary reasons for the poor relationship between stakeholders are destructive, competitive attitudes and the inequitable passing of construction risks. These forces do not enhance the development of more efficient dispute resolution techniques and thus parties rely on litigation to settle their disagreements. Within the public sector these are often worse due to governmental restrictions.

1.2 Construction Industry Initiatives.

Due to the epic proportions of litigation and other symptoms of adversarial problems there are major initiatives in the industry to repair the system. In May 1991 the Dispute Avoidance and Resolution Task Force, DART, was formed by a coalition of construction industry leaders. Their overall goal is to reduce the amount of disputes within the industry. One of their basic assumptions is that 80% of construction disputes occur between the parties to the process.⁸

Other construction organizations have attempted to alleviate the problems by more clearly defining stakeholder responsibilities. The American Society of Civil Engineers, ASCE, published *Quality in the*

⁸DART, pp. 1 & 4.

Constructed Project while the Construction Industry Institute published *Organizing for Project Success* in February 1991. The Construction Industry Liaison Group of New England published *Building a Successful Project Team* to define the team and allocate responsibilities. The Construction Industry Presidents' Forum (CIPF) is holding meetings to search for ways to change the adversarial climate.

Other initiatives have included increasing use of Alternative Dispute Resolution, ADR, techniques to solve disputes in a more efficient manner. Methods have included mediation, arbitration and the use of dispute review boards. Other agencies have tried using alternative delivery methods such as Design/Build and Turnkey methods.

However, the many ideas to fix the problem often appear to be boilerplate answers that lack flexibility in adapting to the varying characteristics of the construction process or restrictions in the public sector. Each construction project is different due to designs, techniques, personalities involved, processes, locations and public laws or regulations. Thus to fix the process requires a systems approach to analyze and mend the problems within the industry.

1.3 The U.S. Army Corps of Engineers.

The Army Corps of Engineers may be considered the largest public sector construction agent in the U.S. with an annual federal budget of \$3-4 billion for civil works projects and \$6-8 billion for military construction projects worldwide. The Corps' construction responsibilities include a large percent of the nation's civil works

projects and all military construction for the Army and Air Force approved by congress. The Corps also provides design or construction expertise to other federal agencies as needs develop.

The Corps' key missions involve; military construction and real property maintenance, civil works projects in the areas of water and resource management, flood control, and hydro-electric power and management of a real estate directorate for federal lands. The Corps conducts engineer research and development, disaster relief, and has limited responsibilities in environmental regulation. Engineering assistance is also provided to other nations. The direct military missions include construction operations in the combat theater of operations and support to combat maneuver units on the battlefield.

USACE civil and military construction responsibilities are separate from the military, combat troop unit activities. Civil/military construction responsibilities are controlled through the Corps Headquarters in Washington D.C and 13 Corps Engineering Divisions⁹ overwatching a total of 40 Engineer Districts throughout the United States, Europe, the Far East and Japan.

USACE contracts out more than 80% of their peacetime design work and almost all their construction to private industry.¹⁰ The Corps' contracting procedures are governed by a number of regulatory documents. The Federal Acquisition Regulation (FAR) applies to all

⁹The 1 December 1992 the USACE Reorganization Plan will reduce the number of Continental U.S. Divisions from 11 to 6 while maintaining the 40 Districts.

¹⁰Simoneau, Craig, I. Alternative Contracting Methods in the U.S. Army Corps of Engineers, Master's Thesis, MIT, June 1992, p. 14.

federal agencies involved in contracting services. The Army is also restricted by the Department of Defense Acquisition Regulations (DFARS) and Army Supplemental Regulations (AFARS). Design services are contracted through a negotiated process in accordance with Public Law 92-582, the Brooks Act. Construction services are contracted primarily through the Traditional Delivery Method, although in recent years the Corps has gained some flexibility in the use of a limited number of alternative delivery methods.

1.4 Corps of Engineer Initiatives.

The Corps of Engineers has implemented many initiatives to alleviate problems within the public sector construction industry over the past decade. In the 1980s the Corps began feeling the bad effects of the adversarial relationships developed from the use of the Traditional Delivery Method for construction projects. Increasing numbers of claims on construction projects were escalating construction costs, sapping resources, and disrupting Corps operations. In 1983-84 the Corps faced almost \$1 billion in unresolved claims and appeals. Some of the cases were expected to take 7 to 10 years to resolve.¹¹ On the average the Corps experiences 850 requests for relief on construction projects per year.¹² At the end of Fiscal Year 1990 the accumulation of unresolved military construction

¹¹McManamy, Rob, "Quiet Revolution Brews for Settling Disputes", Engineer News Record, August 26, 1991, p. 23.

¹²Elmore, John, "Which Procurement and Contracting Methods Reduce Disputes?", Speech Given at the Constructive Resolution of Disputes Conference, Washington, D.C. 7 November 1991, p. 2.

contracts had reached 1500 resulting in millions of federal dollars tied up in litigation.¹³

The Corps began to look for ways to reduce the court case loads and solve the outstanding disputes more efficiently. ADR appeared to be an important answer. In 1984 the Corps began experimenting with the use of Mini-trials. Success in this area led to the use of other methods including disputes review panels, nonbinding arbitration, mediation and facilitation. By 1988 the Corps began an attempt to institutionalize ADR as part of the culture of the agency. Use of ADR was promoted through training and education programs. The program focused on middle level employees and executives and involved managers, lawyers and engineers. The program also involved publishing material including pamphlets, case studies and other experiences. The Corps' objective was to develop ADR techniques as tools to improve "collaborative decision making, not to turn over decisions to a third party, but to hold managers accountable for resolving disputes".¹⁴

1988 marked other important internal changes for the Corps of Engineers. They began implementing other internal fixes to improve operations. The agency streamlined the separate programming and management functions of design, planning and construction. These functions were integrated under the Corps' Project Management System. Roles and responsibilities of various Corps elements were redefined to improve efficiency.

¹³Brubaker, p. 735.

¹⁴Edelman, p. 4.

To improve the quality of project designs, the Corps implemented the "Biddability, Constructibility and Operability Review".¹⁵ This program conducts detailed design reviews at 35% and 95% completion to help eliminate errors and assure quality designs are issued for bid requests. 1988 also marked the Mobile, Alabama District's experiment with a new idea they called Partnering.

In June 1989 the Corps conducted a round table discussion on the aspects of ADR Techniques. This meeting involved representatives from the Corps including senior officers and attorneys, major private sector corporations who do business with USACE and various representatives of private law firms. The agenda was to promote ADR, obtain feedback on how to improve the use and acceptance of ADR and identify the obstacles to its use. The overwhelming results of the conference pointed to the need to implement a process that could focus on the prevention of disputes. The Corps began to take a closer look at the Partnering Concept being applied in the private sector and under way in the Mobile District.

1.5 Partnering.

Partnering is an emerging concept in both the private and public sectors. It has been called a major paradigm shift for those in the industry. Partnering is an innovative strategy that has the goal of enhancing participants abilities to solve problems and deliver construction goods or services in a non-adversarial environment at

¹⁵Elmore, p. 9.

minimal costs in both time and dollars. The focus of this strategy is to build communication and trust between members of the project team and establish common goals and objectives.

The concept was developed in the private sector and has been used for a number of years. Three primary models of the concept have emerged, one which has been applied in the public sector. The first public sector application was in 1988 by the U.S. Army Corps of Engineers. Attention to the public sector application has grown substantially over the past few years. The process has been used long enough to now provide some insight as to its effectiveness.

1.6 Thesis Objectives and Analysis Strategy.

The purpose of this thesis is to analyze the single-project Partnering concept as a dispute resolution system in the public sector construction industry. The questions that will be addressed in this analysis are; What are the current problems in the public sector construction industry? What is the public sector Partnering concept and how is it employed? Does this concept mitigate the problems experienced in the industry? How does the concept mitigate these identified problems? What are some existing barriers to the process and how can this process be improved?

These questions will be answered by investigating the public sector Partnering concept as developed by the U.S. Army Corps of Engineers. This concept has been applied by a number of public sector organizations on projects involving the Traditional Delivery System, that is pre-designed projects contracted to builders through fixed

price lump-sum construction contracts awarded through the low bid process. Three organizations applications are presented, the Corps of Engineers, the Arizona Department of Transportation and the Massachusetts Highway Department. Both state agency applications have involved ex-Corps of Engineers Officers who had previously applied the Partnering Process while serving with the Corps.

The framework of the Partnering analysis will employ elements of the Dispute Resolution System concept developed by Ury, Brett and Goldberg in their book *Getting Disputes Resolved*.¹⁶ The elements of this system are shown in Figure 1-1. This will be referred to as the "Systems" approach throughout the thesis.

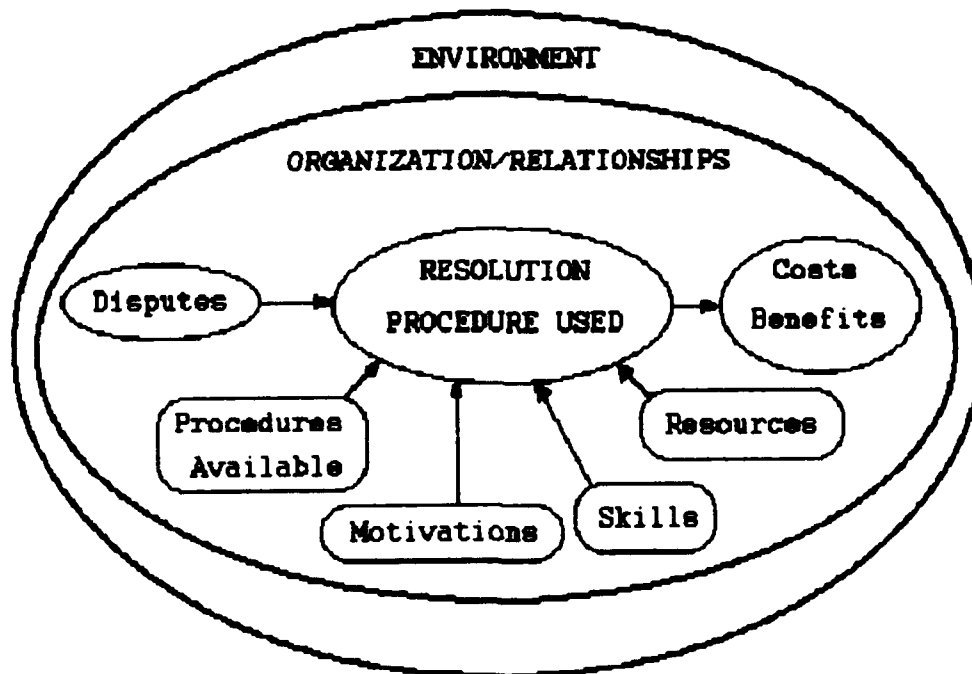


Figure 1-1. Model of a Dispute Resolution System.¹⁷

¹⁶Ury, William L; Brett, Jeanne M; Goldberg, Stephen, B, *Getting Disputes Resolved*, Jossey-Bass Publishers, San Francisco, 1988.

¹⁷Ibid, p. 22.

The Systems concept identifies the two main elements of the dispute resolution system as external and procedural factors. The external factors include environmental elements such as social, economic, cultural and organization relationship issues. The procedural elements involve the process used to solve problems and include procedures available, motivations to use the procedures, skills of parties in applying the procedures and resources available to employ the procedure. How well the dispute resolution system functions as a whole can be identified by the resulting costs or benefits of the overall process.

The systems approach is applied in the following manner. Chapter 2 of this thesis evaluates the Traditional Delivery Process, the most employed public sector construction delivery process, to identify the high costs and inefficiencies of this dispute resolution system. To be successful the Partnering concept must mitigate these problems. Chapter 3 introduces the Partnering concept and presents elements of the flexible public sector model in detail. The Systems approach is applied to provide an initial analysis of this new dispute resolution system. Chapter 4 presents case studies of the three agencies' applications of the process. Chapter 5 conducts a detailed analysis of the Partnering case studies. This chapter identifies beneficial trends, evaluates why and how Partnering mitigates the weaknesses of the Traditional Delivery System and identifies potential barriers to the process. Chapter 6 presents five possible improvements for the system and looks at the future role of the Partnering concept.

CONSTRUCTION INDUSTRY PROBLEM ANALYSIS

The purpose of this chapter is to provide a brief analysis of the adversarial climate that has become prevalent in the public sector construction industry. The issues presented in this chapter will provide the basis for evaluating the effects of the Partnering process which is introduced in Chapter 3.

The Traditional Delivery Process is the most widely used delivery method for public sector construction projects. It is also credited with developing the poorest relationship between parties to the construction process. This chapter evaluates the three phase design-bid-build process, as an example, to identify the high costs and inefficiencies present in the public sector construction industry. The evaluation of the effects and causes of the adversarial problems, characteristic of the traditional process, identify it as a deficient dispute resolution system.

Analysis of the traditional delivery process has been conducted many times in the past and thus is not the focus of this thesis. Further information on this subject can be found in two MIT theses, *Compatibility of Construction Contracting Methods with Projects and Owners*, by Christopher M. Gordon, 1991; and *Alternative Contracting Methods in the U.S. Army Corps of Engineers*, by Craig L. Simoneau, 1992.

This chapter's analysis first identifies the negative effects of the traditional process on projects. These problems are attributed to the adversarial project climate. The remainder of the chapter presents

the causes of this adversarial climate. This thesis attributes the adverse climate to two primary causes; competitive attitudinal issues and inequitable shifting of risks between parties. Application of the Ury, Brett and Goldberg Systems Model identify that the Traditional Process constitutes a Deficient Dispute Resolution System. The conclusion of this chapter is that any process with the aim of alleviating the adversarial problems in public sector construction must mitigate these two primary causes.

2.1 The Traditional Delivery Process.

The delivery of construction services through the application of the Traditional Delivery Process provides one of the clearest examples of the adversarial relationships between stakeholders in the construction industry. This delivery method is a linear process with three distinct design, bid and construction phases. The construction contracts involved are primarily fixed price, lump-sum contracts awarded on the low bid criteria.

This process has been the most often used in this century¹⁸ and has been the primary method for application of public sector construction contracts for years. It is seen as an unbiased method for contracting projects with public funds at minimum price due to the bid process. The design is independent of construction which limits collusion between the designer and constructor. A fixed project price

¹⁸ Gordon, Christopher, M. *Compatibility of Construction Contracting Methods with Projects and Owners*. Master's Thesis, Civil Engineering Dpt, M.I.T, 1991, p. 13.

can be determined for construction because the design is complete, thus less risk is assumed by the government and the public because the project delivery costs are fixed at the start of the project. Normally the designer acts as the owner's representative and receives additional responsibility for monitoring the construction process.

This method has been seen to work well on completely designed projects that incur few changes during the construction phase. However, these characteristics normally apply to smaller less complex projects that are not the norm in today's highly complex, bureaucratic, fast pace construction industry. Whether this process is utilized by the public or private sector it has developed a long list of severe disadvantages over the years.

2.1.1 Effects of the Traditional Process.

Experiences from the use of the traditional process over the years have identified severe disadvantages that can be attributed to adversarial relationships developed between the project owner, designer and builder. The poor relationships between project stakeholders perpetuate a lack of communication and trust between each other which in turn reduces the efficiency of the project delivery.

The most profound impact has been the dramatic levels of litigation and claims resulting from these projects. The Corps of Engineers with \$10 billion of annual construction uses this process extensively and has approximately 850 requests for relief and/or claims each year on construction contracts. Those claims on appeal had a total value of approximately \$570 million in fiscal year 1990, and

...approximately \$550 million in fiscal year 1991."¹⁹ Pending claims are averaging \$1 billion each year. This is only one symptom of the terribly inefficient relationship which develops between stakeholders. Other significant effects include project cost and schedule growth, reduced construction quality and in some instances poorer safety records.

The Corps of Engineer's Chief Counsel, Lester Edelman has stated that the adversarial relationship "leads to increased costs for the taxpayer, declining profits for the contractor, delays to the schedule, and a lack of quality with respect to the work."²⁰ William Brubaker from Headquarters Department of the Army identified that, "The adversarial situation is a harder way of doing things, a way which often results in misunderstood requirements, rework, time delays and litigation."²¹

The separation of the project team is also attributed with poor applications of constructibility analysis and value engineering. This has been identified in public sector, military construction. "Insistence upon sequential procurement practice...robs the military services of much opportunity to exploit constructibility."²² Due to

¹⁹Elmore, p. 2.

²⁰Edelman, Lester. "Alternative Dispute Resolution in the Public Sector." Speech given at 1991 CII Annual Conference, Monterey, CA, 14 Aug '91, 11.

²¹Brubaker, p. 735.

²²McGinnis, Charles, I. "Contract Construction Procurement." *The Military Engineer*, No. 525, Nov/Dec 1988, p. 591.

the method and the adversarial relationship designers and builders do not work to achieve savings in this area.

It is apparent that the social profit is not maximized with this list of deficiencies that are experienced on construction projects. These characteristics often mean that some quality builders will not even compete for work in the public sector to avoid its associated problems. Application of the Systems model concept at this point identify that the dispute resolution system is deficient due to these high costs and lack of benefits.

2.1.2 Causes of the Adversarial Relationship.

Overall the deficient results of the process for delivering construction services are a result of two key elements; stakeholders' competing attitudes that pit one side against the other and the existence and unequal distribution of risks between the members of the project team. These two factors represent environmental elements in the systems model. They exacerbate each others negative effects resulting in a polarized project team, inefficient delivery efforts and a highly adversarial atmosphere.

In this construction process the two key stakeholders, owner and constructor, represent different business cultures that develop their own competing goals. The owner normally desires a quality project delivered quickly and at minimal costs. The builder who accepts substantial financial risk through the lump-sum fixed price contract desires to maximize his profit and thus may develop an incentive to reduce his costs and meet the schedule. He may actually develop a

disincentive to increase quality above the minimum standard. These issues are compounded by the competitive American concept of winning combined with our litigious nature. Risks are enhanced due to the contractual relationships between parties who may not know each other and the state of the U.S. economy.

The Traditional Delivery Process is not the only method that perpetuates these causes of the adversarial relationships. These issues can exist or develop in any construction relationship. But, analysis reveals that the traditional process may represent the worst case example of these problems. The remainder of this chapter will present the primary issues that promote the attitudinal differences and the unequal distribution of risks between stakeholders in the construction process.

2.2 Attitudinal Issues.

Attitudinal issues, for the purpose of this thesis, are defined as environmental elements that tend to polarize parties in the construction industry and enhance negative competitive effects. The attitudinal issues include the competitive feelings that develop between adversaries that any process produces a winner and a loser--the Win/Lose attitude; the litigious characteristics of the U.S. society; the different business or management cultures of the owner, designer and contractor organizations; and the actual competing goals that these organizations may unilaterally develop. These issues are discussed in the following sections.

2.2.1 The Win/Lose Atmosphere.

Within the construction industry, or any industry, it is common to see parties trying to get the greatest benefit for the least effort, or trying to be the winner in a debate over finances or other issues and not be seen as the loser. Stephen R. Covey, a scholar and author in leadership and personal effectiveness issues describes this as the Win/Lose Paradigm of personal interaction.²³

Covey describes it basically as "...if I win, you lose...win/lose, is the authoritarian approach: I get my way; you don't get yours. Win/Lose people are prone to use position, power, credentials, possessions, or personality to get their way." His premise is that most Americans are developed with this notion since birth. Covey states "...most people tend to think in terms of dichotomies: strong or weak, hardball or softball, win or lose. But that kind of thinking is fundamentally flawed. It's based on power and position rather than on principle."²⁴.

He states that life requires interdependence "Most results you want depend on cooperation between you and others. And the win/lose mentality is dysfunctional to that cooperation."²⁵ His example of the failure of this attitude is of a supplier who 'wins' a confrontation with a client. But the win may actually hurt the supplier due to the degradation of the parties initial relationship, the feelings of the

²³Covey, Stephen R. *The Seven Habits of Highly Effective People*, Fireside Book by Simon and Schuster, New York, 1990 p. 206.

²⁴Ibid, p.207.

²⁵Ibid, p. 209.

client, and damage to the supplier's reputation. If this results in a loss of repeat business both stakeholders lose in the long run.

Covey describes the interaction of two people bred in this attitude as leading to vindictive attitudes in which the parties will want to 'get back' at each other and result in a situation in which both parties are hurt by the outcome, a 'Lose/Lose' proposition.

These characteristics all too often describe the attributes of the relationship between the players in the construction industry; owners, designer, builders and suppliers. According to this theory the negative ingrained attitude can only lead to inefficiencies. "Workable risk-sharing is not possible in an environment where one party seeks to gain the advantage over the other."²⁶ This is one element that contributes to the adversarial climate in the construction industry limits communication between parties and leads to inefficiencies.

2.2.2 The Litigiousness of Society.

An attitude that supports Covey's win/lose theory is the American notion that court is another alternative strategy in which to gain a unilateral win. No one could disagree that our American society is highly litigious. The U.S.'s large population of lawyers, backlogged court systems and exorbitant court awards reflect this fact. American's desire to use the judicial system as a threat or an alternative to solve their problems can be a detriment to the way

²⁶Dupes, Steven, R. *Owner/Contractor Partnerships in Construction*. Master's Thesis, University of Florida, Summer 1989, p. 28.

business is conducted in the U.S. and it is hurting the construction industry.

Abraham Lincoln is attributed with a quote in 1850 that identifies the connection between litigation and the win/lose concept. "Discourage litigation. Persuade your neighbors to compromise whenever you can. Point out to them how the nominal winner is often a real loser - in fees, in expenses, and waste of time."²⁷

Organizations target the construction industry to exploit this litigious attitude. A book *The Contractor's Guide to Change Orders* is an example. An ad for the publication stated;

"It's no secret that up to 95% of change orders are buried in the specs and fine print. But now *Contractors' Guide to Change Orders* helps you fight back and win top payment for these potential delays and hidden expenses. Here You'll discover where to look for change orders...how to uncover them in time...how to figure costs...how to maximize your prices and justify them...how to negotiate the most favorable outcome. In addition, the guide includes everything you need to change "hidden" change orders into profit opportunities."²⁸

Other organizations are actually arming both sides by providing courses to both contractors and owners on fighting and winning disputes. The course *Proving Construction Contract Damages* is offered to contractors "...to assist you in the process of calculating and proving what you are entitled." While the same organization provides

²⁷Lunch, Milton, F. "The Liability Crisis-Revisited", *Preparing for Construction in the 21st Century*, Proceedings of Construction Congress '91, ASCE, 1991, p.771.

²⁸Carlson, John, I. Jr. "Which Procurement and Contracting Methods Reduce Disputes?" Speech given at the Constructive Resolution of Construction Disputes Conference, Washington, D.C., 7 Nov '91, p. 1.

owners with *How Owners Defend Construction Claims* "...to teach the owner how to recognize potential claims that may be made against him...how to avoid claims...how to parry claims should they be thrust upon him...and how to turn from the hunted to the hunter, prosecuting his own claims against those who have failed their obligations."²⁹

The fact that many parties within the industry approve of these practices reflects an adversarial problem. This attitude also encourages parties to remain at arms distance and spend valuable project time documenting problems and other issues so they can be prepared for their day in court to win additional fees or fend off claims after the project is complete. This type of project management fails to solve problems in an efficient manner but produces 'defensible alternatives' in no ones best interest. It adversely effects the project raising administrative costs, blocking communication and increasing the adversarial climate between parties.

On this issue Covey states "We live in a litigious society. The first thing many people think about when they get into trouble is suing someone, taking them to court, "winning" at someone else's expense. But defensive minds are neither creative nor cooperative... It provides survival but it doesn't create synergy."³⁰

²⁹Federal Publications INC, *Proving Construction Contract Damages, How Owners Defend Construction Claims, Construction Delay and Disruption Claims*, Course descriptions, Summer 1992.

³⁰Covey, p. 208.

2.2.3 Conflicting Cultures.

A third element that develops competitive attitudinal issues are the differences in the management and business cultures of the owner and contractor organizations. Contractor organizations and operating procedures tend to empower their field representatives. This gives them a fair degree of project control that allows for fast decisions or when necessary quicker access to upper management. Owner organizations tend to be a more bureaucratic, hierarchical structure. This gives less authority or flexibility to lower management levels and creates greater barriers to reaching upper management. Decisions cycles tend to be much longer than the contractor's.

These cultural differences can be even greater between the public owner and private sector contractor. Public sector owners may have a hard time understanding or may lack sensitivity to the business related concerns of private sector builder organizations. Alternatively, private contractors may be very insensitive to the public law constraints of the owner. These two situations provide very different perspectives.³¹

Another example of cultural differences has been experienced by the Corps. "Many government managers believe it is necessary to distance themselves from the contractor to avoid any appearance of impropriety and to preserve total objectivity. Some managers actually maintain that the lack of trust is, in fact, beneficial to the government. Under this reasoning, the performance of a contract should

³¹Johnson, David, P. "Public Sector Partnering", p. 3.

be carried out through an adversarial relationship that ultimately ferrets out truth and justice."³² All of these issues of cultural difference add to the attitudinal problems contributing to the adversarial relationships.

2.2.4 Competing Goals.

Section 2.1.2 identified the different goals that the owner and contractor teams can develop for a project. Another example of different goals is illustrated by a study conducted in 1982. The Construction Industry Cost Effectiveness Project Report identified owner goals as, "complete the project at the most economical cost; construct the project in accordance with specified quality; complete the project on schedule. The contractor goals were identified as, make a profit on the contract; reduce liability exposure on the project; satisfy long term business needs such as survival, growth, greater share of market, prestige, reputation."³³ These unilateral team goals can easily produce conflicts between the parties financial and quality objectives and create polarized attitudes enhancing the adversarial climate.

The Corps' Chief Council, Lester Edelman described this problem referring to the administration of Corps construction contracts, "...we naturally set up two opposing management teams. The

³²Edelman, p. 11.

³³Dupes, pp. 28 & 35, from: The Business Roundtable, *Contractual Arrangements*, Report A-7, A Construction Industry Cost Effectiveness Project Report, New York, 1982, p. 4.

government's team develops its own position setting one sided goals and objectives, regardless of the effect they will have on the contractor. Contractors engage in the same process with the inevitable result: an adversarial relationship."³⁴

When project teams develop separate goals and objectives they also develop independent decision processes where decisions are made that will best support their own unilateral goals. The decision process becomes 'privileged information' that is not shared with other organizations. "Lacking knowledge, trust, and confidence of what decisions are being made by the other party, it is assumed that the decisions will be detrimental to one's own organization. Consequently, the two parties are assured adversaries throughout the process"³⁵ Under these conditions dispute resolution procedures do not exist, problems between the two parties are not addressed, but are ignored causing them to grow and fester for the duration of the project.

2.3 Construction Risks.

The other major cause for development of the adversarial construction climate is the unequal sharing of project risks between parties. Risk is defined as "the possibility of suffering harm or loss".³⁶ Within the construction industry primary risks are the possibility of personal injury or financial losses. Avoiding personal

³⁴Edelman, p. 11.

³⁵Dupes, p. 26.

³⁶Ehrlich, Eugene, Oxford American Dictionary, Oxford University Press, NY, 1960, p. 585.

injury on construction projects is a goal of all stakeholders and will not be addressed here. Financial risks are the key element that can increase adversarial attitudes. Financial risks for an owner or contractor can include the loss of capital, market potential or the impacts of liability claims. These risks increase with project size and complexity.

While in a typical industry one would expect the chance for profit to increase with the assumption of responsibility for greater risks this tends not to be true in the construction industry. The greater the risk assumed may not correspond with a chance for great profit. Thus, there is a trend for parties to attempt to shed risk, passing it to other parties. Under the traditional delivery process this passing of risk tends away from the owner toward the contractor who has little control over many of these risks.

There are four key elements that contribute to the level of financial risks of parties in the construction industry. These are, project changes or construction delays that increase costs or project life; working relationships that must develop between strangers with little or no knowledge of each other; risks passed through contracts which often limit the power or control of a party; and the effects of a strong or weak economy that contribute to market forces and shift power between construction parties. These issues all contribute to the adversarial relationship between construction participants.

2.3.1 Risks Due to Changes and Delays.

Changes to construction documents or project designs and project delays for weather, changes, problem resolutions and unexpected difficulties normally result in additional financial costs for one party or another. While the stakeholder who is responsible for bearing these costs is often clear, arguments can develop for shifting additional costs to another party. The traditional delivery process causes the greatest number of disagreements due to changes and delays because of the nature of the lump-sum fixed price contract.

Risks for the possibility of changes and delays are effected by all of the elements described in the last section. Parties unfamiliar with their construction partner may not know how the other party will react to these financial risks. Contract documents may identify how parties can be expected to act. Ambiguous construction documents make interpretations critical and may result in different objectives or expectations of parties. The economic strength of companies or the industry may add risk to how a party may attempt to shift responsibility for these problems. The manner in which responsibility for changes or delays are accepted or passed by stakeholders will severely affect the relationship that will develop between the project team members.

2.3.2 Risk Due to Unknown Partners.

Construction projects typically require strangers to develop working relationships. It is not uncommon for key leadership of the two organizations to meet for the first time at the project ground

breaking ceremony. When parties find themselves in this situation the unknown personal or business characteristics of the other individual or organization represent important risks. The parties do not know how the other party will actually treat them in carrying out their contractual agreement.

These risks are often attributed to be greater when private contractors deal with public owners.³⁷ This may be attributed to the selection process which is based only on a low bid figure as selection criteria. Either organization's reputation may not be well known and individual characteristics may be even less understood.

The only understanding that a contractor may have of the owner's expectations may his own interpretations of the bid documents or plans and specifications for the project. "The contractor assumes that the owner has adequately described the project and its objectives. The degree of accuracy the government realizes in defining its requirements and eliminating errors often set the stage for the relationship."³⁸

The unknown elements of fairness, reasonability, cultural management techniques or organizational goals and expectations can lead to restricted communications and lack of trust between parties. These risks of the unknown partner can contribute to distrust and the development of an adversarial relationship.

³⁷Myers, James, A. "Constructive Resolution of Disputes" Speech given at MIT Symposium on Construction Industry in the Northeast: Opportunities for the 21st Century, 12 May 1992, p. 4.

³⁸Johnson, p. 4.

2.3.3 Risks Through Contracts.

The construction contract is the primary element that can allocate risks to stakeholders in the construction industry. There are three manners in which risks can be passed in contracts, by contract type, the method of contract award and through language or clauses included in the contract. Variations of these three elements can lead to unequal sharing of financial risks and can have an important impact on the business relationship developed between parties.

2.3.3.1 Contract Type.

In his thesis, Christopher Gordon defines contract type as how the owner will pay the contractor for work performed.³⁹ In the case of the traditional delivery process the contract type is a fixed price in the form of a lump-sum amount for the entire project. This type of contract places the greatest degree of risk on the contractor. The contract requires the builder to carefully monitor his project costs and perform his work for the total price specified at the beginning of the project. Typically he will receive no reward for finishing early but can receive a penalty for a late completion. In some instances the contractor may also be required to shoulder unforeseen costs.

A Unit Price contract is a variation of the fixed price contract that can reduce contractor risk. Under a unit price contract the builder receives a fixed payment for services performed; materials placed or earth moved. This contract requires a closer relationship

³⁹Gordon, p. 111.

between the owner and builder as both parties monitor materials and costs. This type of contract can bear risks if the contractor unbalances his price estimates in an effort to gain higher costs for certain services.

Reimbursable contracts are contracts in which the owner pays the contractor for all his services, reimbursing him for all his associated costs. Under this contract the owner assumes the greatest financial risks. The owner is responsible for monitoring all the contractor costs while the contractor may actually have a disincentive to build in an efficient manner. Variations of this contract are cost-plus contracts where the owner reimburses the builder for costs and adds a proportional fee, or fixed fee contracts where the contractor is reimbursed for costs and receives a fixed fee for the entire project.

A contract that could be described as a hybrid between fixed fee and reimbursable contracts is the Guaranteed Maximum Price Contract (GMP). Under this, a reimbursable contract can be controlled by the owner identifying a maximum price he will reimburse the contractors costs. This avoids providing the contractor with a blank check while providing a more equitable sharing of project delivery risks.

Thus the type of contract can determine the risks that must be accepted by the project stakeholders. Maximum contractor risk is involved in the fixed price lump-sum contract used in the traditional process. Maximum owner risk is involved in the reimbursable cost plus contract. The GMP contract is the best for an even allocation of risk.

Contract type can effect relationships by the manner in which risk is shifted.

2.3.3.2 Award Methods.

The award method is the manner in which an owner selects the contractor and price for providing the construction services. The award method used under the traditional system is the low bid procedure. The method of competitive bidding uses market forces to build competition between contractors and bases selection on the lowest price provided by a contractor. This process can be most risky for the contractor if he lowers his price to an unrealistic level minimizing any contingency or profit margin to win the award. The other risk to the contractor is if an error was made in estimating the project costs. If the project is awarded the contractor is bound to his low bid price.

Variations of the competitive bid process are prequalification and multi-parameter bids. Pre-qualification requires bidders to meet certain minimal criteria set by the owner to be eligible to bid on a project. The criteria may include experience, bonding, past record or capabilities. Under multi-parameter bidding the owner selects the contractor based on a set of criteria other than the sole low bid criteria. The owner will typically pay a higher fee for contractors selected in these manners.

Negotiated awards are the other category for selection. Typically the contractors selected under this process shoulder less risk and are able to negotiate a better fee than under the bid process. If the

owner finds himself forced to conduct a single sourced negotiated contract he will face the greatest risks because there will not be market forces working in his favor. The negotiated contract price may be substantially higher. The contractor normally accepts the least amount of risk in this situation.

Thus the award method used to select contractors and identify his fee vary. Different methods provide different allocations of risk which will effect stakeholder relationships before the project has even started. Low bid procedures used under the traditional process place the greatest risk on contractors while single source negotiated contracts place the owner at risk.

2.3.3.3 Contract Language.

The third important manner in which risks are shifted in contracts is through their content. Two important aspects of content are clauses that are used to indemnify one side or shift risks to another party and ambiguous documents that are crafted in an uncoordinated manner. Both issues can polarize the contracting parties and enhance an adversarial relationship.

Risk shifting clauses are seen in one-sided contracts that attempt to place unreasonable responsibilities on one of the stakeholder teams. Under the traditional process risk is most often shifted to the contractor. Examples of these clauses include no damage for delay clauses where no matter who causes the project delay the builder is not awarded extra money for the delay. Differing site condition clauses that require the contractor to absorb the cost for

any changes required to solve ground material or subsurface problems found during construction. Indemnification clauses that hold owners or designers harmless against third party claims for deficiencies that would normally be attributed to them. Again it is the contractor that will absorb any additional financial burden.

On federal contracts clauses exist that are meant to help protect the public and minority groups but often cause the contractor additional burdens. Examples of this can include the Buy American Act which requires the builder to verify materials, supplies and manufactured articles used on a project were actually made in America. Other clauses include the Davis-Bacon Act for payment of prevailing wages or the disadvantaged business, women's business or minority business employment clauses.⁴⁰

Contracts with ambiguous clauses can lead to misinterpretations or arguments for liability indemnification that may not be clear to all parties. This can result in financial risks or court battles that only hurt stakeholder relationships. These issues often develop when parties either use 'boilerplate' or 'one contract fits all' contracts that try to address any circumstance for use in any contracting situation. Contracts that are drafted "...with boilerplate and scissors may be quick, but it can create a cumbersome, conflicting set of instructions..."⁴¹. The uncoordinated contracts often develop

⁴⁰Simoneau, pp. 23,24.

⁴¹Edminster, Richard, R. "Cost Effective Construction: Attacking Transaction Costs." *Construction Business Review*, Mar/Apr 1992, p. 51.

conflicting clauses. Ambiguous bid documents also cause major controversies between stakeholders. This can lead to higher bids by contractors hoping to overcome the problems through contingency finances.

It is sometimes true that "Whoever writes the contract pays his attorney to do everything to shift risk to the other party. Up goes the price. Contractors hope to make it up with claims."⁴² Thus the contract content can cause prices to escalate, risks to be shifted in an inequitable manner resulting in loss of project control by contractors, increasing claims and seriously affecting the working relationship between project participants.

2.3.5 Economic Impacts.

The state of local economies as well as the economic condition of construction businesses also have an effect on the relationship that will develop between project participants. A weak economy or times of economic downturn may allow owners to take advantage of market forces in their favor. Under these conditions, when construction companies are hungry for work, the owner has more leverage in obtaining lower project costs.

In bid submissions or negotiations contractors may cut their margins sometimes accepting very low or even no profit or contingency margins. These lower margins are often unrealistic and will result in claims by contractors in an effort to make up the money not included

⁴²McGinnis, p. 591.

in the original contract but necessary for project completion and survival. "Bidders don't allow for contingencies against unforeseen conditions, knowing such clauses would make their bids less competitive. In addition many contractors admit to being unrealistic about production forecasts in order to win an award. As a result, litigation and claims have become a by-product of the competitive bidding process-a "necessary evil" protecting contractors from the system."⁴³ This economic effect increases competition and often produce more company failures and a high degree of adversarial relations. This can also backfire on the owner leading to inexperienced contractors or designers awarded work for which they may not be qualified.

These economic issues have other impacts besides the great escalation of claims and disputes. As each stakeholder in the construction process requires more work for less money parties become unable or unqualified to deliver a quality product. The President of the Associated General Contractor of America (AGCA), Marvin M. Black, identified the connection between reduced profit margins and reduced construction quality. He stated, "Profit margins have dwindled to a point where (quality has) gotten our attention."⁴⁴ These economic impacts severely hurt the business relations between stakeholders.

⁴³Nicholson, Joseph, "Rethinking the Competitive Bid" *Civil Engineering*, Jan 1991, pp. 66,67.

⁴⁴Schriener, Judy. "AGC Promoting Quality." *Engineer News Record*. March 25, 1991, p. 12.

2.4 Summary Analysis.

The adversarial business relationships that have become prevalent throughout the construction industry are adversely impacting the industry. The traditional delivery process provides a good example of the causes and effects of the poor relationships and adversarial atmosphere that can destroy construction projects.

Adversarial construction relationships are causing great increases in litigation and claims between owners and contractors. Projects are experiencing negative effects of increasing cost and schedule growth, poor constructibility analysis and value engineering savings, reduced quality, increasing bureaucracy and in some cases poor safety records.

The causes of the adversarial business relationships are a result of competing attitudinal issues and inequitable sharing of risks between construction stakeholders. These are summarized in Figure 2-1.

Competing Attitudes	Inequitable Risk Sharing
1. Win/Lose Attitudes	1. Risk of Delays and Changes
2. Litigiousness of Society	2. Business between Strangers
3. Stakeholder Organizational Culture Differences	3. Risk Passing Through Contract Documents
4. Competing Stakeholder Goals	4. Economic Effects

Figure 2-1, Causes of the Adversarial Climate.

Applying Ury's Dispute Resolution System model to this analysis confirms that this is a deficient system. The attitudinal and risk shifting causes of the adversarial problems in the industry are negative external pressures within the disputes resolution system. These issues shown in Figure 2-1 represent negative environmental and organization/relationship pressures destructive to the system.

The causes of the adversarial relationships are poor attitudes and owner passing of financial risks, the effects are large numbers of claims and litigation. The submission of claims and going to court is the disputes procedure in use under this environment. The owner uses the power of the construction contracts to fight contractor disputes. Due to the flawed stakeholder relationship the contractor's recourse is to fight back with rights in the form of claims and litigation. This inefficient method of solving disputes in an adversarial atmosphere lacks any consideration of stakeholders interests. It is based on power and rights. Ury, Brett and Goldberg define this type of dispute resolution system as distressed, it is illustrated in Figure 2-2.

According to their concept under a distressed system "few disputes are resolved through reconciling interests, while many are resolved through determining rights and power." An effective system reverses this trend solving most disputes through reconciling interests rather than "determining who is right or who is more powerful."⁴⁵

⁴⁵Ury; Brett; Goldberg; p. 18.

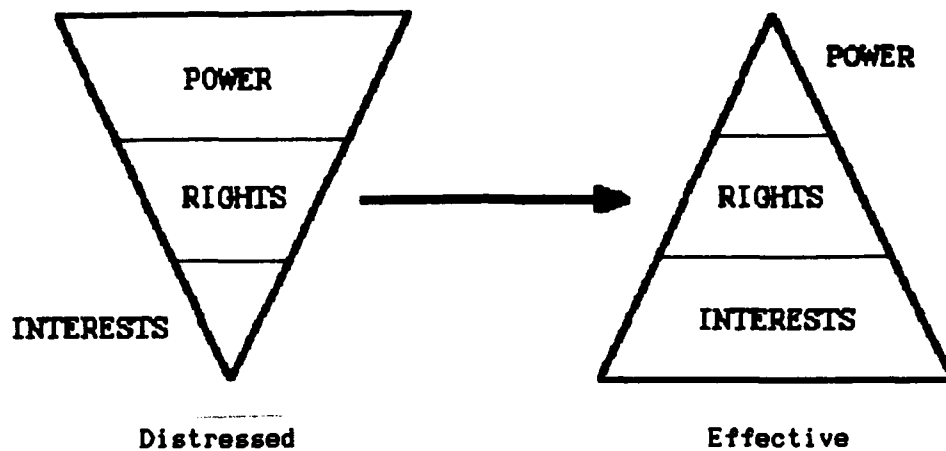


Figure 2-2. Distressed and Effective Dispute Resolution Systems.⁴⁶

The traditional process illustrates the worst effects of these issues. This process is the most used by public sector owners. These owners are experiencing all of the problems outlined in this section. To improve the efficiency of the public sector construction industry, actions must be taken to mitigate the outlined causes of the adversarial climate. The environment must be improved and the 'effective pyramid' system must be used to solve disputes. Efforts have been taken to do this through the use of Alternative Dispute Resolution methods (ADR) and alternative delivery methods such as design/build or other contracting methods. However, many public sector agencies will continue to be bound to the use of the traditional delivery process by laws, regulations and legislation. For these

⁴⁶Ibid, p. 19.

organizations another alternative has emerged, the Partnering process. This concept is introduced in the next chapter and will be analyzed throughout the remainder of this thesis. Key to analyzing its effectiveness will be the ability of the process to mitigate the outlined causes of the adversarial climate within the construction industry and develop the traits of an 'effective' dispute resolution system.

PARTNERING

The purpose of this chapter is to present the Partnering concept and conduct an initial analysis of the Partnering process using the Dispute Resolution System Model. This chapter introduces three Partnering models that are in use today. Two models apply to the private sector where the concept originated, the third model is a hybrid developed for use in the public sector. The public sector model will be presented in detail.

The U.S. Army Corps of Engineers is primarily responsible for adapting the private sector concept into the public sector Partnering model. The Corps first tried the concept in 1988. In 1991 the Association of General Contractors of America (AGCA) published a manual describing this process. The development of public sector Partnering by the Corps has set the foundation for the process employed by many governmental agencies today and is the concept analyzed throughout the remainder of this thesis.

After introducing the Partnering process an initial analysis of the public sector model is conducted through the application of the Dispute Resolution System Model. This initial analysis evaluates the potential ability of the Partnering model to address the environmental and procedural problems of the traditional delivery process introduced in Chapter 2. The analysis applies Stephen Covey's model of human interaction, the win/win paradigm and Roger Fisher and William Ury's thesis on Principled Negotiation to describe elements of the Partnering process.

3.1 The Partnering Concept.

The Partnering concept was developed in the private sector and has been applied to both the manufacturing and construction industries. At its very basic level it is a process that these organizations have used to develop close working relationships and pool their resources to enhance their efficiency and improve productivity.

In 1987 the Construction Industry Institute (CII) formed a Partnering task force that conducted an industry wide study of the process. In 1991 they issued their report. The CII found that Partnering was a complex concept that could not be identified as either existing or not existing. They describe it as a three dimensional continuum based on elements of trust, shared vision and long-term Commitment.⁴⁷ It could also be defined as a process based on open communication, common goals, and team development.

Partnering has been described effectively by using the metaphor of a successful marriage. Both require the commitment of both sides as well as "the aspects of a long-term relationship, cooperation, mutual trust and confidence, and support..⁴⁸ Applied to the construction industry "Partnering is aimed at assuring that the contractor and the owner develop a win/win relationship which discourages gain by one at the other's expense."⁴⁹

⁴⁷Hancher, Donn, E. "Partnering: Contracting for Quality", Preparing for the 21st Century, Proceedings of Construction Congress '91, ASCE, 1991, p. 466.

⁴⁸Rudy, John, A. "The Contractual Side of Partnering", *Construction Business Review*, January/February 1992, p. 65.

The application of the Partnering process between organizations is not dissimilar to W. Edward Deeming's philosophy of Total Quality Management or the concept of Participative Management within a single organization. In 1986 The Construction Industry Institute (CII) identified the characteristics of Participative Management as; clear definition of goals, management and employee trust, open communications, decentralized decision making, employee involvement, and teamwork. Organizations that applied these elements realized gains through; increased productivity, improved morale and healthier relationships, acceptance of change, increased management effectiveness, and better quality decisions.⁵⁰

The Chief Council for the U.S. Army Corps of Engineers, Lester Edelman, describes the concept within the public sector as a relationship between contractors and owners that is a, "...more collaborative ethic and contract "Partnership" where trust, cooperation, teamwork, and the successful attainment of mutual goals are the hallmarks...it involves a drastic change in traditional mind-set. When we speak of Partnering, we are not referring to a contractual, formally structured agreement between the parties. Instead it is a change in attitude that we hope will foster a nurturing environment that involves risk sharing. The ultimate goal is the elimination of the 'us' against 'them' thinking and the formation of a 'we' mentality."⁵¹

⁴⁹Johnson, David, P. "Public Sector Partnering", p. 3.

⁵⁰Dupes, p. 32.

⁵¹Edelman, p. 10.

A large contractor who has practiced the concept on Corps projects describes it as a "Joint commitment to openly and quickly solve job problems". It involves a change by both sides in the approach to contract administration, is based on mutual respect and trust, is focused on creative cooperation, not confrontation, and results in synergy, creative teamwork. Its objective is to achieve common project goals which include quality, completion within budget, on time, and safely and involving no rework or litigation.⁵²

The concept is not intended to portray an overly generous or "good old boy" relationship. This would then reflect the attributes of what Covey defines as the lose/win situation where consideration dominates courage and maintenance of the relationship takes a lead over interest or one party dominates the other.

There are those within the construction industry that do not recognize it as a new concept. They believe it is a new name for 'retainer arrangements', 'evergreen' or 'sole-source contracting' activities.⁵³ However, it is argued these arrangements tended toward self interest and were at least partially adversarial. The President of the AGCA, Marvin Black has stated, "Partnering is not anything new. Its getting back to the old-fashion way of doing business with a handshake and taking responsibility for what you do. Partnering formalizes that agreement."⁵⁴

⁵²Peter Kiewit Sons, Pacific Co, "Partnering Briefing", slides 4-7.

⁵³Schriener, Judy, "Partnering Paying Off on Projects", *Engineer News Record*, Oct 14, '91, p. 25.

⁵⁴*ibid.*

3.2 Partnering Models.

Given the broad, flexible concept of Partnering in the previous section it should be clear that many forms could and do exist. Partnering takes on different forms in the public and private sectors. It also varies when applied between different organizations; manufacturer/supplier, manufacturer/distributor, customer/supplier, owner/constructor, designer/constructor as examples. As the applications of the Partnering concept have increased three broad categories of the idea have evolved. Two models applied in the private sector are Pure Partnering, as defined by the Construction Industry Institute (CII), and Limited Source Partnering. The third model developed from the private sector applications for use in the public sector, its development is attributed to the U.S. Army Corps of Engineers. The Association of General Contractors of America (AGCA) has published a document based on the Corps model.

What Partnering is not to be confused with is the legal 'Partnership' with the associated liability of both parties. It is important to understand the scope of each model in order to understand their differences. The following sections will introduce these three models and then present the Corps of Engineers model in detail.

3.2.1 Pure Partnering.

The CII Partnering task force conducted an industry wide study of the Partnering process beginning in 1987 to determine the feasibility of its use in the construction business. CII issued their report in 1991 and identified the Pure Partnering mode. as follows;

"Partnering is a long term commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each of the participant's resources. This requires changing traditional relationships to a shared culture without regard to organizational boundaries. The relationship is based on trust, dedication to common goals, and an understanding of each other's individual expectations and values. Expected benefits include improved efficiency and cost effectiveness, increased opportunity for innovation, and the continuous improvement of quality products and services."⁵⁵

The CII model is based on three key dimensions; trust, shared vision, and long-term commitment between two or more organizations that pool their resources to the benefit of both participants. The development of this relationship includes an extensive evaluation and pre-selection process resulting in an owner employing one contractor for numerous projects after settling on a joint Partnering agreement. Before the integration of organizations a mutual understanding of organizational cultures and shared goals are developed.

The CII definition of a long-term commitment in this model is important. This describes an ongoing process throughout a large series of related or unrelated projects where lessons are learned and continual improvements are made to the Partners' relationships and their products. A system for evaluating performance of the Partnership and providing feedback to each party is essential to the long-term success of these relationships. The CII task force identified the earliest examples of Pure Partnering as a 1984 agreement between Shell

⁵⁵Construction Industry Institute, *In Search of Partnering Excellence*, CII Special Publication 17-1, July 1991, p. 2.

Oil and SIP Engineering and a 1986 arrangement between DuPont and Fluor Daniel.

This pure model is intended to bring two stakeholders together whose strengths can bolster the other parties weaknesses or needs. This should produce a "mutually supportive relationship with participants treated as equals in a win/win situation."⁵⁶ In the construction industry this process "...requires that contractors participate with the owner in the project planning and estimating phases to minimize both cost and schedule."⁵⁷

One way of understanding this Partnering arrangement is that it approaches the concept of 'vertical integration' within an industry. Michael E. Porter defines vertical integration as "...the combination of technological distinct production, distribution, selling, and/or other economic processes within the confines of a single firm. As such, it represents a decision by the firm to utilize internal or administrative transactions rather than market transactions to accomplish its economic purposes. For example, a firm with its own sales force instead could have contracted, through the market, an independent selling organization to supply the selling services it requires."⁵⁸ This concept in the private sector is similar to the concept of privatization in the public sector.

⁵⁶Ibid, p. 2.

⁵⁷Ibid, p. 13.

⁵⁸Porter, Michael, E. *Competitive Strategy*, The Free Press, New York, 1980, p. 300.

In the examples of Shell/SIP or DuPont/Fluor Daniel although the companies did not merge into a single firm, Shell and Dupont do not open their construction needs to market transactions. Rather, they have developed long-term agreements with single construction firms to provide for their overall construction needs. Neither Shell or DuPont have a constant, or every day requirement for construction services, but for these companies it is a recurring requirement for their businesses. These arrangements provide the production firms or owners with committed, responsive and flexible design and construction capabilities as if they were in-house organizations but without the overhead requirements of supporting the resources in-house. This provides the construction companies with a generous supply of construction projects into the future.

The CII Partnering study reviewed 27 Partnering arrangements. 18 of the relationships were categorized as this form of Pure Partnering while 9 were identified as a hybrid arrangement. The partners employed various contract types; 68% used cost reimbursable contracts, 11% were lump-sum, and 21% had used both types. The award methods also varied 68% of the companies used a negotiated process while 32% relied on open bidding.⁵⁹ There was also a wide range of purposes for the Partnering arrangements. 89% of the Partnerships provided for engineering study services while only 54% involved actual construction.

⁵⁹CII, p. 14.

The CII also identified that the contents of the contracts between parties in these arrangements did not differ greatly from the provisions of conventional engineering or construction contracts. The companies identified that the benefits were in the performance of the contracts. The behavior of the parties and conduct of actual work were what made the difference.⁶⁰

There are downsides to these arrangements as well. Some arrangements did not include specific contractual specifications that would bind the partners to remain aligned. The relationship could be terminated at any time by either party. Thus if the Partnership fails one major issue becomes knowledge of company trade secrets and the dissemination of this information to third parties.

CII's evaluation of Pure Partnering was that it would not be advantageous for single projects, especially small ones (small was defined as \$2 million or less). This is due to the complexity and effort required to initiate and develop the relationships.⁶¹

3.2.2 Limited Source Partnering.

One private sector hybrid of Pure Partnering has been defined as Limited Source Partnering.⁶² This model maintains the basic concept of the CII's pure model. The key differences are that it involves an owner who conducts a pre-contract bid selection screening of possible

⁶⁰ibid, p. 36.

⁶¹ibid, p. 7.

⁶²Rudy, p. 62.

project bidders and develops a short list of acceptable bidders for a range of different projects. The pre-bid screening can be a very detailed analysis of the prospective partners similar to the effort that goes into the partner search in the pure model. Whenever a project comes up the short list of bidders are invited to bid on the project. The bidders normally know who their competition is limited to.

This process results in an agreement with one or more organizations for contracts on a project by project basis based on certain characteristics; specified regional location, project type, or construction period. Because the owner has a better knowledge of the talents and capabilities of the short list of bidders the owner can make a more informed choice of the best partner for the particular job along with the evaluation of the bid. This takes on many of the characteristics of the multi-parameter bidding selection process but to a much higher level of sophistication.

Thus the Pure Partnering characteristics of shared vision, long-term commitment, and trust are all still part of this process. Its major differences with Pure Partnering are the larger pool of alternative partners, the possibility of sporadic term of performance over the long-term life of the relationship, and the possibility for the use of market forces, between short list bidders competing for work.

3.2.3 Public Sector Partnering.

A third Partnering model was initiated by the U.S. Army Corps of Engineers. The Corps Model has characteristics that allow its use by public sector organizations. The legal requirements of federal or public sector policies in contracting construction services limit the characteristics of Pure Partnering that may be practiced by governmental agencies. The ability to freely negotiate, or commit to long term repeat contracts is limited by legislation, for the Army by the Federal Acquisition Regulation (FAR) and its numerous supplements.

In 1990 the Corps of Engineers, Mobile, Alabama District published *A Guide to Partnering for Construction Projects*. This manual identifies the Corps process as "...an attitude. It is a way of doing business with a contractor or customer that recognizes that we have common goals which can be achieved through cooperation and open communications."⁶³ The manual provides recommendations for implementing a process that builds a cooperative attitude and team commitment that make up the Partnering atmosphere.

The key elements of the Corps Model are that the formal process is initiated after a project is awarded to a constructor through the traditional bidding process, it employs a retreat or team building session to develop the actual scope of the Partnering arrangement, develops problem solving techniques and results in a non-contractual "Partnering Agreement" only for the duration of the single awarded project.

⁶³U.S. Army Corps of Engineers Mobile District, *A Guide to Partnering for Construction Projects: A Process for Implementation*, January 1990, p. 1.

The process uses group interaction techniques to quickly develop a single, cohesive project team prior to initiating construction. The objective is to develop a more open, productive working relationship based on the win/win or mutual gain philosophy. Emphasis is placed on the positive aspects of common goals, commitment, cooperation, trust, communications, and problem solving processes to resolve issues or claims. The process seeks to avoid the adversarial relationship and achieve a more equitable sharing of risks.

These characteristics of the single project application differ in many ways with the Pure or Limited Source Models. The Corps model uses a different selection methodology, and jump starts the relationship between partners. Although this process cannot capture all the advantages of the Pure Process, substantial advantages have been realized. The Corps first tried this concept in 1988 on a \$70 million civil project, the replacement of a lock and dam in Tuscaloosa, Alabama. Since 1988 the Corps has gained Partnering experience and currently attempts to employ it on all their projects.

Many organizations have shown a great interest in the Corps Process. In 1991 the AGCA published a manual *Partnering a Concept for Success* that is based on this process. Other public sector agencies that have begun or plan to use this model include the US Navy, Federal Highway Administration, the Arizona and Washington State Departments of Transportation, Caltrans, AASHTO and Colorado, Florida, Massachusetts, Minnesota, New Mexico, and Ohio highway agencies.^{64 65}

⁶⁴Tarricone, Paul, "Howdy Partner" *Civil Engineering*, March 1992, p. 72.

3.3 The Corps of Engineers Model.

By January of 1990 the Corps had applied the Partnering concept on two projects in the Mobile, Alabama District. This district's experiences led to their publishing a manual, *A Guide to Partnering for Construction Projects*. Its purpose was to provide the basic characteristics of the process the district had implemented on the two projects. Neither of the projects had been completed at that time.

Further development of the Partnering model was due to the support of the Corps' Commander. The 'Chief of Engineers Focus 1990' was a result of the experiences of the previous ten years. It was presented by the Chief of Engineers, at that time LTG Henry Hatch, in an August 1990 policy letter on Alternative Dispute resolution. The policy applied to all the members of the Corps of Engineers organization, military and civilian. Policy Memorandum #11 identified the progress the Corps had made in the use of ADR techniques and promoted the use of Partnering as a way to improve the record. It stated;

"Partnership demands the will to resolve disputes. Clearly the best dispute resolution is dispute prevention. Acting to prevent disputes before they occur is key to building new cooperative relationships. By taking the time at the start of a project to identify common goals, common interests, lines of communication, and a commitment to cooperative problem solving, we encourage the will to resolve disputes and achieve project goals."⁶⁶

⁶⁵Arizona Department of Transportation, *Partnering News*, Spring 1992, p. 4.

⁶⁶Hatch, Henry, J. Lieutenant General USA, "Commander's Policy Letter #11 Subject: Alternative Dispute Resolution." USACE, 7 August 1990.

Along with the goal to reduce disputes the Corps set goals in the construction areas of safety, quality, schedule, and budget. This endorsement by the Corps' top leader increased experimentation with Partnering in other Districts. In 1992 the Corps policy is to attempt Partnering on every possible project.

The Chief of Engineers' 1990 Policy Memorandum #11 along with the Mobile District's guide provide the framework for the application of the Corps' public sector process. In the fall of 1991 the AGCA manual provided another reference for this process. The AGCA manual provides a process description, sample forms and programs for implementing a Partnering process on a single project and matches the Corps Model. Some of the few differing aspects of this manual are addressed in the process description in the next section.

3.3.1 The Corps Partnering Process.

Although a step-by-step procedure is outlined in the Mobile District and AGCA manuals the Corps emphasizes that the process should be considered flexible and modified to support individual project needs and personalities. It is applicable to projects of any size or type. The Corps has identified eight key tenets for implementing the Partnering process. They are shown in Figure 3-1 and will be discussed in this section in relation to preparation, conduct of the initial workshop and follow-up requirements.

There is no requirement for a party awarded a Corps contract to enter into a Partnering arrangement. The decision is strictly voluntary. Within the specifications of Corps projects there is a

clause that identifies that the project execution may include the implementation of the Partnering process. If the awardee agrees to participate the preparation phase begins immediately.

The Corps Eight Partnering Tenets

1. Begin Early.
2. Obtain Commitment from Top Management.
3. Identify a Sponsor or Champion.
4. Select Participants.
5. Select Facilitators.
6. Schedule Initial Workshop.
7. Conduct Workshop.
8. Follow-up.

Figure 3-1.⁶⁷

The objective of the Partnering process is to achieve implementation prior to the conduct of any actual construction and thus achieve a closer working relationship and develop a team atmosphere before any project problems have a chance to develop. The process must Begin Early. As mentioned earlier the Corps includes the offer to Partner in the project specifications, it is recommended that the offer is clearly identified in the solicitation for bids. This may

⁶⁷USACE, Mobile District, pp. 2&3.

have an impact on the contractor's bid price. It must also be clear that the costs for the process will be shared equally by all parties.

Once it has been determined that the awarded project will be Partnered, it is critical to obtain the full commitment of the top management of all stakeholders. On a Corps project this means the District Commander and the President of the construction company or companies as well as key subcontractors. The education process must also begin with these individuals to ensure the process and its advantages are fully understood.

The next key tenet is to identify a Partnering Sponsor or Champion. This person bears the overall responsibility for starting and maintaining the process and positive climate throughout the project. This is normally a person most knowledgeable in the process. The AGCA recommends a Champion from both organizations. On some projects this can be the resident engineer and/or the project manager. In other situations it has been found it is better to have a party from the home offices take on this function.

With the Sponsors identified it is necessary to select participants of the Partnering Team from the stakeholder organizations. The members should include the key personnel that may be expected to interact during the project life and those with decision authority. The owner's area or resident engineer and the contractor's counterpart as well as the designer, construction managers, superintendents, subcontractors, and suppliers are examples. The support staffs from both the contractor's and owners home offices should also participate to ensure they understand the process and most

importantly, who they will be working with. In some cases the Corps has included attorneys to ensure they understand their role in preventing contract disputes has priority over resolving them. There are arguments for keeping this group small versus including anyone that is willing to participate.

More recently it has become routine to send the key project leaders (resident engineer and counterpart) to a leadership school for a week to insure these two key participants fully understand the philosophy of Partnering, its application and get to know each other.

In preparing for the Workshop the decision must be made whether or not to use Facilitators to enhance the process. Although the Corps recommends their use as a critical element, the AGCA does not find them as important. The facilitator is a neutral or non-partisan party trained in team building and group dynamics. He guides the workshop meetings by helping the project team achieve their goals, remain focused on the content of their meeting and guides the process. He/she helps to maintain open communication between participants and insure all individuals are equally represented. For some large projects more than one facilitator may be required.

The AGCA points out if they are used they should have "...training in conflict management, listening and communication skills, as well as insights into individual problem solving styles...Professionals such as behavioral or organizational psychologists, industrial psychologists, management consultants or

educators would be good sources for facilitators.*⁶⁸ The Corps has lists of organizations that can provide these services.

Scheduling the initial workshop must be considered very early in the preparation. It should take place as soon as possible after the project award. Typically workshops should be expected to take 2-7 days depending on the project team size and the complexity of the project. It is best to conduct these at a neutral location away from the distractions of any participating party's home office.

The Conduct of the initial Workshop becomes the foundation of a successful Partnering process. The workshop is discussed in detail the next section. Its overall aim is to bring together the project stakeholders and develop open communications, identify issues and concerns, shared project goals and establish a project problem solving procedure. The plan for implementing the Partnering arrangement for the life of the project is developed and participants sign a symbolic Partnering Agreement or Charter that outlines the arrangements objectives.

The Partnering process only begins with the workshop. The workshop 'Jump starts' the stakeholder's relationships; maintaining the momentum, attitudes, and commitment of all participants is a full time job. It is necessary to conduct Follow-Up activities throughout the life of the project to sustain the Partnering plan. The maintenance plan for the Partnership is developed during the initial workshop. This plan can include follow-up facilitated sessions,

⁶⁸Associated General Contractors of America, *Partnering a Concept for Success*, p. 6.

project meetings, reinforcement training, and assessments of the progress of the project and implementation of the Partnering Agreement. The long term success of the program is highly reliant on follow-up sessions. It is vital that the champion also monitor progress to identify if problems arise that require additional team sessions.

3.3.2 The Partnering Workshop.

The initial workshop, as identified in the last section, sets the tone for the Partnered project. Although the desire is to conduct the workshop prior to the start of the project, there are instances where it has been conducted later, even halfway through a project if the use of Partnering was conceived after the project start. The participants should include all the parties identified as Participants in the preparation phase including the facilitators. Although the length and contents of a workshop depend on the size and type of project, the key workshop elements identified by the Corps are shown in Figure 3-2 on the next page.

It is important that all participants 'buy into' the process. To assist in achieving this guest speakers sometimes discuss key advantages that they have realized with the process. Then the workshop begins the development of communication skills between participants. This is critical to remove the barriers that often develop in a traditional, adversarial construction relationship. The initial focus is on strengthening participants' interpersonal communication skills.

This includes skills such as active listening, empathy and the ability to express information.

Elements of Corps Partnering Workshop

- a. Strengthen interpersonal skills.
- b. Self-examination exercise.
- c. Teamwork development exercises.
- d. Team exercises.
- e. Define past project strengths and weaknesses.
- f. Instruction in conflict management techniques.
- g. Develop project problem solving strategy.
- h. Exercise problem solving on items in element 'e'.
- i. Define project Partnership goals.
- j. Execute project Partnering Agreement.
- k. Develop implementation plan.

Figure 3-2.⁶⁹

To assist the understanding of this, self examinations can be given that identify individual's personalities. An example is the Myers-Briggs personality type indicator test. By understanding one's own personality they better appreciate their innate communication skills. These also assist in the understanding of group dynamics and

⁶⁹USACE, Mobile District, attachment B.

teamwork development through identification of other personality type characteristics and communication skills. This is developed further in team exercises based on personality types that express the advantages of cooperation over competition. As the process continues parties from all organizations get to know each other on a more personal basis.

Next the group begins to focus on issues relevant to the project itself. The participating organizations identify problems and concerns each have experienced on similar, past projects. Each organization develops a list of the top five issues of concern that they feel apply to the up-coming project. At this point more instruction may be given by the facilitator on conflict management or negotiation techniques. The aim is to show the advantages of negotiating based on merits and principle rather than on positions or power and rights. This leads to the development of problem solving techniques or strategies by the group. The project team produces a generic problem solving technique they will use to handle problems that will undoubtedly develop during the project. Identifying this up-front helps to ensure a more rapid resolution of problems through a common understanding of the process. The process of escalation or efficiently elevating unresolved problems to higher authorities may be a part of this process and is discussed in later chapters.

The participants then return to the problem issues already identified. They apply the problem solving model to these issues and are faced with developing action plans or possible solutions. The process should be accomplished by groups that represent a mix of all project stakeholders. One group may include the home office personnel

of the owner and the contractor while another may be the job site personnel from both organizations. In the hours spent developing the action plans through combined efforts and exchanges of the owner-contractor teams, the Partnering process is enhanced by the growing insight, interactions, personalities and understanding of the participants. The intent of these actions are to improve the open communications and trust between parties.

The developed action plans and group interactions set the stage for the team development of mutual goals and objectives and the overall process necessary to achieve them. The goals and objectives differ from project to project but include issues such as; meeting design intent, value engineering, schedule maintenance, streamlined contract review periods, minimizing unnecessary paperwork, ensuring project safety, project completion on time and within budget, or a commitment to no litigation. Again it is the team that must develop these goals along with the solutions in a cooperative effort.

Attainment of the mutual goals becomes the overall objective of the project team. These goals are described in the project's Partnering Agreement. This document is a basic, one page, statement of the principles of the Partnering arrangement. Besides the goals the agreement may include expectations, standards for shared accountability, commitment, and dispute resolution techniques. All of the participants sign this non-contractual agreement to acknowledge their individual and team commitment to achieving these goals. This document along with project logos or other unique paraphernalia is

used as a reminder of the developed team effort and shared commitments of project participants.

A final element of the workshop is building a plan to implement and maintain the Partnering process. This includes developing an evaluation plan and scheduling follow-up meetings. The evaluation plan provides a regular self assessment of the Partnering arrangement by all the participants. This is achieved through the use of questionnaires that team members fill out at routine periods, monthly, quarterly or prior to follow-up partnering sessions.

The questionnaires utilize the projects Partnering Goals as the criteria for rating the project and associated relationships. The relative importance of each objective can be weighted and compared against a set standard to provide a quantitative analysis of the project performance. Results of the questionnaires identify if objectives are not being met, Partnering concepts are failing or being ignored, and how well the communications process is working between team members. This allows the stakeholders to address the problems and implement solutions to realigning or revitalize the Partnering process. "Without joint evaluations you are never sure where you are let alone where you are going."⁷⁰

Finally, decisions are made on when to conduct scheduled, follow-up workshops to reinforce the Partnering principles agreed upon. These follow-up workshops are normally much shorter, review past decisions, field and solve new issues, and maintain the original

⁷⁰Johnson, p. 8.

commitments of the agreement. Practice has shown that they are normally held at six month intervals throughout the project life. They have been scheduled a various times depending on the requirements and strength of the particular project teams.

The costs of the workshops represent the primary expense associated with this method. The Corps attributes most of this to the payment of professional facilitators. Their fees can average approximately \$1000 per session per day. Cost estimates for an initial four day workshop are \$6,000 to \$10,000, and \$3,000 to \$5,000 for follow-up sessions. Other expenses could include charges for hotel conference rooms, travel costs, keepsakes, supplies, or other administrative costs.

3.4 Analysis of the Public Sector Model.

Analysis of the Corps' Partnering model must investigate how the outlined process addresses the elements of the Ury, Brett & Goldberg Model of a Dispute Resolution System. The analysis in this section addresses three key elements: the external or environmental and organization/relationship issues; the dispute resolution procedural issues; and the requirements of individual motivation, skills, and resources to implement the overall process.

The analysis identifies that Partnering does address the improvement of external and procedural issues. The overall goal of the Partnering tenets and workshop procedure is to develop an all gain or win/win environment. This is analyzed using Stephen Covey's definition of the win/win paradigm. Due to the intent to improve the environment,

the process also introduces dispute resolution procedures based on principled or integrative negotiations which focus on stakeholder interests rather than power and rights. The main goal of the resolution process is to actually prevent disputes. Finally the analysis identifies possible weaknesses in the areas of motivation, skill development and resource availability required to implement the process. Evaluation of case studies is necessary to determine the impact of these elements.

3.4.1 Environmental Issues.

The basic elements of the Corps Partnering concept focuses on the improvement of the project environment and interpersonal relationships of the project stakeholders. The goal of the Corps tenets and the project workshop is to maximize communication, develop trust, and build a team relationship that supports the attainment of mutual goals for the benefit of all stakeholders. A review of Stephen Covey's discussion of the elements of the win/win paradigm identify the Corps model has the potential to improve the environment of the dispute resolution system.

The last chapter identified that the prevalent attitude exhibited by parties within the construction industry is based on the win/lose or positional bargaining paradigm. This is especially true in the public sector where the great majority of construction contracts are based on the Traditional delivery method. To abandon the adversarial environment prevalent within the industry requires a new way of thinking, changing the attitude and unfair risk shifting. Covey

defines this as the Win/Win Paradigm. Covey's basic premise is "...that one person's success is not achieved at the expense or exclusion of the success of others. Win/Win is a belief in the third alternative. It's not your way or my way; it's a better way, a higher way."⁷¹

Covey's premise identifies five key dimensions that are needed to develop and sustain a win/win atmosphere. The five elements are; Character, Relationships, Agreements, Supportive Systems, and Process. According to Covey the win/win foundation is based on one's character. He identifies integrity, maturity, courage and consideration and an abundance mentality as the important attributes of character. Courage is important with respect to expressing feelings and convictions. But, this must be done with consideration, understanding that another person's convictions may differ significantly. The abundance mentality is the idea that there is plenty of pie for everyone. This is opposed to the scarcity mentality, in which one believes there is a limited amount of pie that must be split to feed everyone. People with an abundance mentality show a greater degree of humility and can more easily share recognition and credit, power or profit with those involved in a process.

Trust is the most important aspect of a Relationship. Covey defines trust with the metaphor of an 'emotional bank account'. Trust between people is increased through deposits in the form of courtesy, kindness, honesty, and keeping commitments. In a very positive

⁷¹Covey, p.207.

relationship the amount of trust becomes very high and a reserve can be built up. This trust is used in business or negotiations. If honest mistakes are made in a strong relationship the trust reserve will compensate for them without allowing the account to drop to an unacceptable level. A high trust account results in open, effective communications, an increased potential for learning, problem solving and greater creativity.

The third dimension is agreements. Covey believes that once favorable relationships have been established, parties can mutually develop agreements that define their win/win relationship. The agreements have been referred to as performance or partnership agreements. They identify the overall objectives and feelings of the parties as a team. Their effect is to clearly identify the expectations of the group as a whole, enhance commitment and encourage interaction on a horizontal plane rather than vertically through the 'hovering supervisor'. The recommended elements of the agreements are the groups; desired outcome, specified guidelines, available resources, standards of performance, and consequences. Covey believes that these agreements help define group expectations, and provide criteria with a set standard to measure the teams success.

The Supportive Systems and Processes within an organization are required to reinforce the win/win attitude. The systems referred to include the training, planning, communications and compensation systems within the organization. They must all be guided by the win/win principle. Examples may be leadership from the top or incentives in line with the performance agreement. The fifth

dimension, Process, refers to the method used to obtain win/win solutions to problems. Covey identifies four steps; 1) see the problem from the other parties point of view 2) Identify the key issues and concerns 3) Determine what results would constitute a fully acceptable solution, 4) Identify possible new options to achieve those results.⁷²

Covey's theory identifies the need for parties to work toward mutual benefits. He believe that these mutually satisfying alternatives lead to improved commitment between parties, cooperation rather than competition, and synergy that produces a higher level outcome. This idea of a win/win situation or mutual gain for stakeholders, is the fundamental idea upon which the Corps Partnering strategy appears to be based. The Partnering elements of leader commitment, and the workshops focus on improving interpersonal and team skills, understanding the differences in organizational cultures and developing team goals outlined in a written, though noncontractual, agreement show the elements of Covey's win/win paradigm.

The basic premise is to move from the win/lose to the win/win attitude. This shift is portrayed in Figure 3-3. The Partnering process attempts to move from the overly competitive environment, one with a proper mix of concern for ones own interests (courage) and concern for others interests (consideration), to a collaborative process. This analysis identifies that the process has the potential to improve the external elements in the dispute resolution model and

⁷²Covey, p. 229.

enhance the ability to implement an improved problem solving procedure.

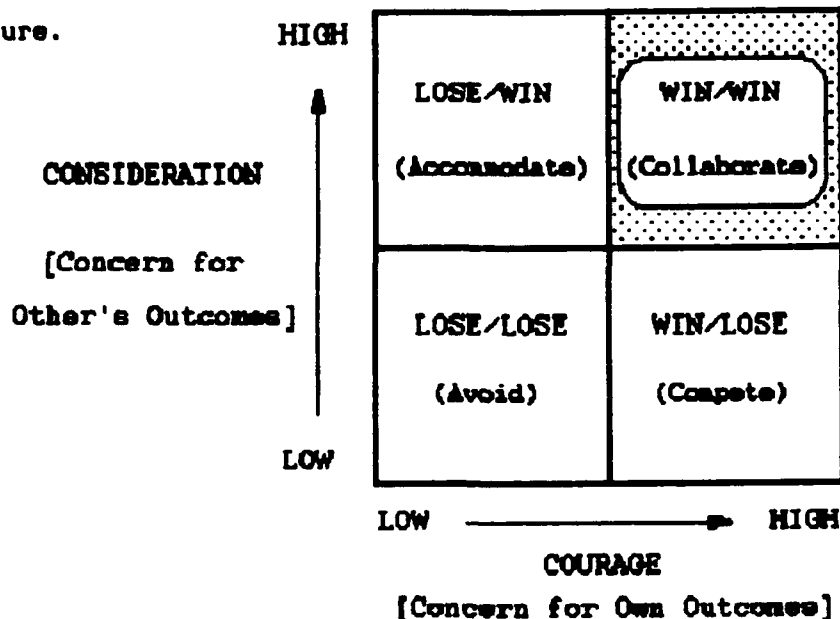


Figure 3-3. The Shift in Paradigm.⁷³

3.4.2 Dispute Resolution Procedure.

The potential for the Partnering process to change the environment and intra-organizational relationships is important due to the favorable effect this could have on improving procedures for solving disputes that develop. Two key procedural issues of the Corps model are the goal of dispute prevention and solving disputes that do develop based on stakeholders interests rather than power or rights as described in Chapter 2.

The idea of dispute prevention is an important concept. This idea exists in the process outlined in the Mobile District's manual and is

⁷³This diagram combines the elements of Covey's win/win paradigm (p. 218) and elements of The Dual Concern Model, from Lewicki, Roy, L; Litterer, Joseph, A. *Negotiation*, Richard D. Irwin Publishers, Homewood IL, 1985, p. 104.

addressed directly in the Chief of Engineers Policy Memorandum. The Partnering concept focuses on the goal of prevention of problems rather than the repair of relationships damaged by adversarial disputes and lengthy court battles. This idea of prevention versus repair is best understood through the use of a continuum of problem solving techniques shown in Figure 3-4.

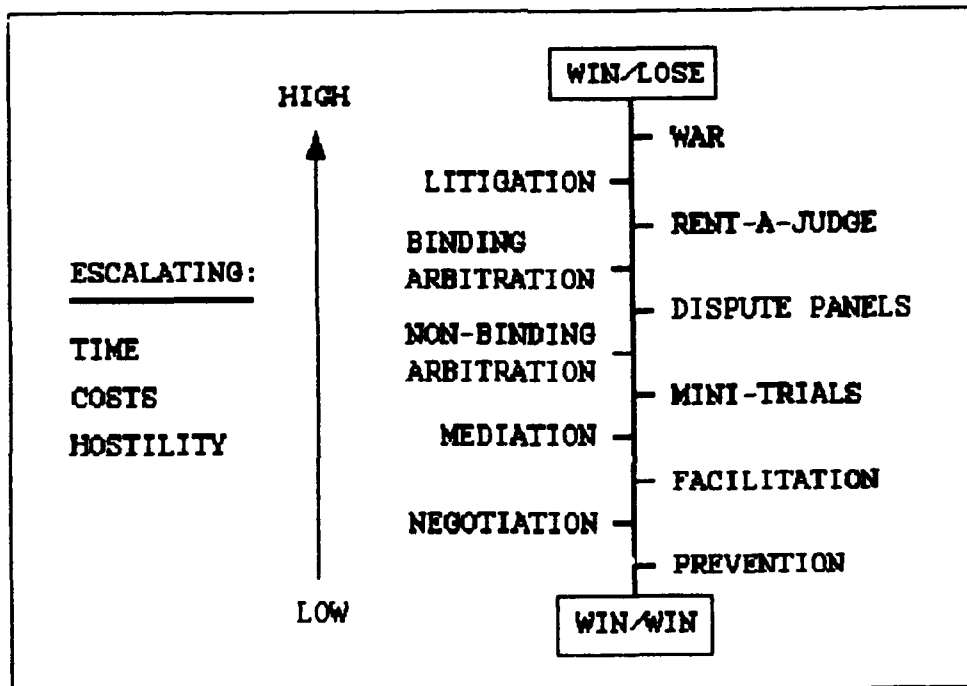


Figure 3-4. The Continuum of Problem Solving Techniques.⁷⁴

The Corps of Engineers attorneys refer to this as the Continuum of Alternative Dispute Resolution (ADR) Techniques. At the top, of Figure 3-4 are dispute resolution techniques that involve the use of a third party with binding decision authority. These techniques include

⁷⁴Edelman, Lester. "Resolving Disputes Without Litigation." *The Military Engineer*, No. 536, July 1990, p. 21.

litigation and at the very extreme use of violence and war. At the bottom of the continuum are the dispute prevention and negotiation methods where disputants solve their problems through dialogue. Between these two extremes are the numerous ADR possibilities. By moving from the bottom to the top of the continuum, the procedures exhibit increasing; complexity, implementation costs and hostility between parties. There is a point on the continuum where a third party receives the authority to resolve the dispute with a binding decision.

It becomes clear that the procedures at the bottom of the continuum have the characteristics associated with the win/win atmosphere and possess the greatest chance to obtain solutions with mutual gains. The win/lose atmosphere is prevalent at the top. The continuum does not represent a finite number of techniques other strategies can develop through creativity and flexible use of the techniques listed.

The Partnering strategy fits at the very bottom of the continuum where the technique's characteristics include; prevention, low hostility, low complexity and low cost. Here "parties most knowledgeable about construction-not the lawyers-resolve points of contention, before they require arbitration, mediation, disputes review boards or at worst, litigation."⁷⁵

The other element of the dispute resolution procedure is how disputes that do develop are solved. The Partnering workshop initiates the development of shared interests and goals between project

⁷⁵Tarricone, p. 72.

stakeholders and the development of action plans or problem resolution models. These elements of the process are characteristic of the procedures based on principle and interests rather than power and rights as described in Chapter 2.

The procedures the Partnering process advances are described by Roger Fisher and William Ury in their book *Getting to Yes* and indorsed by Covey. Fisher and Ury suggest that in dealing with differences stakeholders should "...look for mutual gains whenever possible, and where your interests conflict, you should insist that the results be based on some fair standards independent of the will of either side. The method of principled negotiation is hard on merits, soft on the people."⁷⁶

While Fisher and Ury believe that a good relationship is not a requirement for reaching solutions that are mutually beneficial for all parties, it can be an advantage. They write "A working relationship where trust, understanding, respect and friendship are built up over time can make each new negotiation smoother and more efficient."⁷⁷

They state that mutually favorable solutions are reached when stakeholders do not conduct positional bargaining based on fixed pie, but by developing a larger pie through negotiations that; 1) separate the people from the problem, 2) focus on interests not positions,

⁷⁶Fisher, Roger; Ury, William; Patton, Bruce; *Getting to Yes*, 2nd Edition, Penguin Books, New York, 1991, p. xviii.

⁷⁷Ibid, p. 19.

3) develop numerous options for each party's mutual gain, 4) select an outcome based on objective criteria rather than either sides bare will.⁷⁸ These are characteristics of the "efficient" system described in Chapter 2. By operating this way - through good communication, listening skills and negotiations based on merit - favorable solutions that are wise, efficient, and improve the relationships of the parties are found. Both parties obtain gains from their original position.

These elements of Principled negotiation are promoted in the Corps Partnering model. Along with the potential of the Partnering process to improve the environment and attitudes of stakeholders applying the elements of this negotiation and problem solving process give the public sector process the potential to overcome the weaknesses of the traditional deliver process.

3.4.3 Motivation, Skills and Resources.

It appears that implementing ideas such as Covey's win/win philosophy or Fisher and Ury's negotiation techniques within any industry today may have a great many problems. These theories present very ambitious ideas for changing the way most of us were brought up and a major change in the historic way parties within the construction industry have operated; employing win/lose tactics.

Covey states that "...dealing with Win/Lose is the real test of win/win. Rarely is win/win easily achieved in any circumstance. Deep issues and fundamental differences have to be dealt with. But it is

⁷⁸Ibid. p. 10.

much easier when both parties are aware of and committed to it and where there is a high Emotional Bank Account in the relationship."⁷⁹

The final phase of this initial analysis must address the three System elements of motivation, individual skills and resources available to implement the process. These elements play a major role in the development of this new paradigm. The motivation for stakeholders to initiate and maintain the process is critical. It would appear that the most important motivational factor would be proof that the process can provide benefits above the costs of the traditional way of doing business. This will be addressed after presentation of Partnering case studies. Another factor that would appear to provide motivation for the stakeholders to first try the concept are the costs associated with doing business the traditional way. These costs were shown to be high in Chapter 2. Parties must believe that the process can improve the attitudes and reduce the risks of the old process. The concept of motivation will be addressed again in Chapter 5.

The individual skills necessary to implement this process appear to be significant. This is primarily due to the new paradigm that the process represents. The win/win or mutual gains process and use of principled negotiation require the development of skills and coaching to continue the process. While the leadership schools can provide training for key project personnel the majority of the stakeholders are only introduced to the concepts during the workshops. The ability

⁷⁹Covey, p. 221.

of parties to firmly develop the skills appears to be an initial weakness of the process.

The resources required for the process include both financial and training needs. Because the financial expenses for the workshop appear to be low, the important resource is the trainer. The key resources for developing the skills are the facilitator during the workshops, the leadership schools attended by key project personnel, documentation available on the subject and the Partnering Champion or coach. The only resources that are available throughout the project life appear to be manuals and the Partnering Champion. While these are key, a weakness may be a responsive resource available at the project site to assist and maintain the process.

This discussion of motivation, skills and resources required for implementation of the Partnering process are only initial assumptions based on the model of the dispute resolution system. A better understanding of the system will result from analysis of a series of projects that have implemented this Partnering process.

3.5 Chapter Summary.

The Partnering concept was developed in the private sector and has been applied to both the manufacturing and construction industries. The basic concept involves the development of a close working relationship between organizations that pool their abilities to enhance their efficiency and productivity. Three models for the Partnering process have emerged, the Pure Partnering Model identified by the Construction Industry Institute, the Limited Source Model and

the Public Sector Model developed by the U.S. Army Corps of Engineers and first applied in 1988.

Analysis of the Public Sector or Corps Model using the Dispute Resolutions System analysis identifies that the process has the potential to improve the environment and organization/relationship elements of the system. The potential for an enhanced environment in conjunction with the dispute prevention and principled negotiation procedures mark it as a potentially 'effective' dispute resolution system. Issues exist over the ability of the process to provide adequate motivation, individual skills and resources to be effectively implemented. Further investigation of applications of the process in a series of case studies should provide insight as to the roles these issues will play and the ability of the Partnering process to achieve this shift in paradigm.

PUBLIC SECTOR PARTNERING APPLICATIONS

The purpose of this chapter is to present construction project case studies that apply the Public Sector Partnering Process outlined in Chapter 3. The projects selected were executed by three public sector agencies; The U.S. Army Corps of Engineers, The Arizona Department of Transportation, and The Massachusetts Highway Department. All three of these agencies have applied the public sector model outlined by The Corps manuals. Both of the state agencies Partnering applications have involved retired Corps of Engineers Officers who applied the Corps process while commanding Corps Districts in the United States.

Nine projects are presented in this chapter. It is important to investigate a number of different cases to gain a better understanding of the Partnering Process. The goal of this chapter is to present applications of the flexible process under various circumstances. The cases represent Partnering applications by different organizations and personalities on a wide range of projects. The projects vary in design, size, complexity, levels of completion and success. The case presentations include project descriptions, characteristics of the Partnering workshops, the project problem resolution models, project team goals, follow-up issues and results or current statuses. All but one of the projects presented involved the application of the traditional delivery process.

4.1 U.S. Army Corps of Engineers.

Today virtually every Corps of Engineer District is gaining experience implementing the Partnering Process. The Corps projects presented in the following sections were executed by the Mobile, Alabama and Portland, Oregon Districts. These two Districts have lead the Corps in applying the Partnering concept. The Mobile District was the first to attempt the idea in 1988. The Portland District initiated their first project in 1989 applying lessons learned in Mobile. The project case studies focus on these two Districts because their Partnering applications have proceeded the furthest with respect to project completion.

The case studies include the following projects: The Mobile District and The Corps' first project the \$70 million, William B. Oliver Lock and Dam Reconstruction in Tuscaloosa, Alabama, 1988-1992; a \$17 million, Test Operations Control Center at Cape Canaveral, Florida, 1989-1990; the Portland District's initial project a \$330 million, Bonneville Lock and Dam project composed of three separate contracts, 1989-1993; and the \$180 million, Air Force J-6 Rocket Test Facility, in Tennessee started in 1989.

For the discussions that follow it is important to understand Corps contracting authority. The Corps Districts are the agencies responsible for the execution of projects approved by the federal budget process. Each Corps District has a contracting officer who is overall responsible for the development and settlement of construction contracts. Over the past four years these responsibilities have passed between three positions. Originally the contracting officer was the

District Engineer, typically an Army Colonel. This was changed to the Deputy District Engineer, normally an Army Lieutenant Colonel. Now in 1992 it is changing again to a full time civilian contracting officer. The District contracting officer has virtually unlimited dollar authority.

On the actual construction projects the Contract Administrator is the Corps Resident Engineer. This employee has the authority to approve single contractual changes up to \$50,000. Thus, for a single project the resident engineer may negotiate numerous modifications for \$50,000 each in accordance with the applicable regulations.

4.1.1 Oliver Lock and Dam.

The reconstruction of the William B. Oliver Lock and Dam in Tuscaloosa, Alabama, in 1988 was the first attempt by the Corps to apply the Partnering Concept. Under the jurisdiction of the Mobile District, the Partnered contract was the second phase of the \$110 million Oliver project. This contract was for the replacement of an old lock with a modern 110 by 600 foot lock with a 28 foot lift and the reconstruction of a 800 foot dam 45 feet high. The construction site was 2800 feet downstream from the original site. The project was designed in-house by the Corps. In April 1988 the FRU-CON Construction Company was awarded a lump-sum, four year, fixed price contract based on their \$69,950,000 low bid.⁸⁰ The Corps and the contractor agreed to try a concept they called Partnering after the project was awarded.

⁸⁰Dupes, p. 39.

The initial Partnering workshop was conducted over four days from 18-22 April 1988. The estimated cost of \$35,000 was shared by both participants. The workshop employed a neutral facilitator from the Synergistic Consulting Group of Mobile. A total of 13 participants representing the home office and project staffs of both the Mobile District and FRU-CON attended. The participants are listed below.⁸¹

	<u>Corps</u>	<u>Contractor</u>
Home Office:	Chief of Construction	Vice President
	Construction Program Manager	Chief, Project Support
	Structural Engineer	Project Support
	Geotechnical Engineer	
Job Site:	Resident Engineer	Project Manager
	Assistant Resident Engineer	Project Engineer
	Office Engineer	Quality Control Rep.

The workshop agenda followed the Corps process initially focusing on attitude adjustments, Myers-Briggs personality exercises, general team building and communication skills, development of trust and project issues. The stakeholder discussions of project strengths and weaknesses led to the identification of the teams top five concerns. The major issues were, excessive change orders and claims; poor submittals and certifications; scheduling; poor problem solving responses; suspicion and lack of trust between parties.⁸²

⁸¹USACE, Mobile District, Appendix C.

⁸²Dupes, p. 43.

The participants divided into home office and job site groups to develop action plans to solve these major issues. The action plan development took on different forms but applied basic problem solving techniques. The key steps involved 1) Identify the problem; 2) Identify a solution objective; 3) Identify causes of the problem; 4) Identify impacts of the problem on the project; 5) Identify detailed solutions to each of the problem causes. The development of action plans covered a number of sessions and improved group interaction and understanding throughout the process.⁸³

The project team developed a generic action plan or problem resolution model for project disputes. The key elements of the process were, to quickly identify and communicate problems to team members; commitment to jointly engage in problem analysis; the desire to solve problems at the lowest level but escalate the problem to home office staffs if necessary; continuous monitoring of resolution efforts; utilization of Principled Negotiation and team approval of problem resolutions.⁸⁴ A goal of 120 days was set for any problem resolution process and was included in the Partnering Agreement.

The development of the team goals involved identifying each stakeholder's key interests. During this workshop the level of trust between parties reached a high level. The contractor actually divulged their profit margin. "This margin could be achieved at the end of the contract if there were no outstanding disputes. Therefore, a bottom

⁸³ibid, p. A-11.

⁸⁴ibid, p. 45.

line shared goal of completing construction without outstanding disputes (was) adopted."⁸⁵ At the time it was concluded that if this goal was achieved it would be a first for any Corps project of this scope. The actual project team goals are listed below.⁸⁶

1. Safety; No fatalities and a reportable accident frequency less than 1.25
2. Quality; IAW Plans and Specifications without rework.
3. Schedule; Timely completion with the first lock opened by December 1991 and no more than a 21 day shut down on the old lock.
4. Budget; Completion within budget and a cost growth limited to \$2 million (2.9%).

The team also assumed the goal of improving the contractor's profit to \$1 million. Due to this objective the team adopted the logo 'The Million Dollar Team'. This logo appeared throughout the project on hats, coffee mugs, coolers, patches and correspondence. The team signed the symbolic Partnering Agreement identifying the team goals at the conclusion of the workshop (Appendix A1).

Evaluation forms were developed based on these goals. The evaluations were to be completed once a month by all project personnel. The forms included twelve areas that were ranked on a scale from 1-5. The categories included; Quality, Safety, Scheduling, Submittals, Equipment, Communications, Labor Relations, Subcontractor

⁸⁵Priscoli, Jerome, Delli, "Public Involvement; Conflict Management and Dispute Resolution in Water Resources and Environmental Decision Making." Working Paper #2 ADR Series. USACE, Oct 1990, p. 12.

⁸⁶Dupes, p. 45.

Operations, Materials Management, Public Relations, Problem Resolution and Change Order Resolution.⁸⁷

The workshop participants completed surveys before and after the initial Partnering Session. The identical questionnaires posed 8 questions related to attitudinal issues involving problem resolution, communication, teamwork and concerns for the other party. Responses involved ranking perceptions from 1(weak)-5(strong). The two surveys for this project showed attitude improvement. The results are portrayed in Figure 4-1. Quantitatively the workshop improved the contractor's attitude from an average score of 3.34 to 4.6 and the owner from 3.4 to 4.7. Both represented 38% improvements based solely on the workshop activities. The results of the workshop were attributed to the decentralization of decisions to the field personnel and greater potential for synergistic accomplishments.⁸⁸

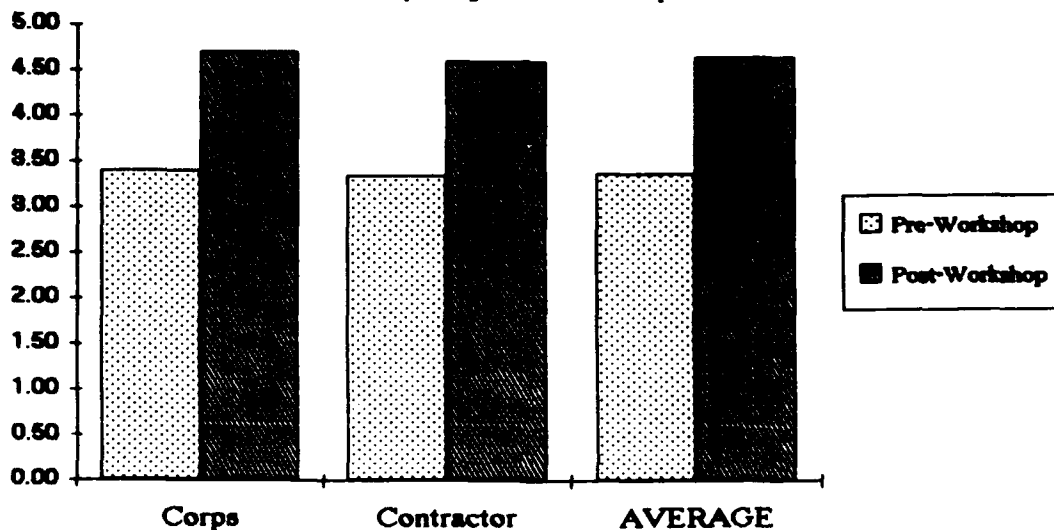


Figure 4-1. Oliver Lock and Dam Initial Workshop Survey Results.

⁸⁷Ibid, p. 47.

⁸⁸Ibid, p. 51.

The team planned the initial follow-up workshop for August 1988 and then at six month intervals. These workshops were conducted 60 miles from the project in Birmingham, Alabama. At the first follow-up it was apparent that the team needed to reinforce the team objectives, roles, responsibilities and commitment to the Partnering agreement. Monthly evaluations, for example, were not being completed on time. The initial follow-up issues included problem resolution, meeting effectiveness, giving responsibility to lower levels and improvement of home office support.⁸⁹

At later follow-up workshops actual project issues became the overriding subjects. Workshop facilitators designed exercises to solve the real issues brought up by the stakeholders. It was observed that as time passed between workshops there was a "greater tendency for people to slip into their old habits."⁹⁰ During a critical period the 'Partnering Champion', the Corps Chief of Project Management from the District Office, was forced to visit biweekly project meetings to help the team maintain 'the big picture view'. The champion had to insure the meetings took place and that objectives were achieved.

In September 1992 the project was in the clean-up stage and set for a final on time completion in December. According to the Corps Project Manager upon completion the project Safety was excellent, there were no fatalities, and one reportable injury; a strained back. The Contractor had met very high quality standards. All schedule

⁸⁹Ibid, p. 53.

⁹⁰USACE, Mobile District, Appendix C.

objectives were met. The Corps had effected \$2 million of owner changes (2.9%). However, the contractor had not achieved the \$1 million profit. It was found that the builder had underbid the project. Originally the second low bid had been \$77.9 million, a difference of \$8 million. The contractor felt an economic loss.⁹¹

Although several disputes did develop on the project, they were all solved through the use of the problem resolution model. Two particularly large disputes were almost elevated above the District level. These involved claims surrounding sand and foundation preparation specifications. A \$2.4 million dollar settlement was finally achieved between the District Engineer and the FRU-CON owner. This decision did require a higher level endorsement. The project will be complete without any litigation or outstanding claims. There were no value engineering goals for the project and none were achieved.⁹²

The Corps project manager felt that this, first Partnered project, was a major success. The greatest problem on the project besides the low bid was the significant change in personnel. By the project completion the contractor had only one of the original workshop participants remaining on the job and the Corps' District Engineer had also changed. He believed that changes in personnel must be expected and planned for. Follow-up workshops must be initiated to bring new team members on line.⁹³

⁹¹Birindelli, Joe, Project Manager, Project Management Division, Mobile District, USACE, Telephone Interview, 1 Sept 1992.

⁹²Ibid.

⁹³Ibid.

4.1.2 Test Operations Control Center.

The Mobile District's second experience with Partnering was the construction of the Test Operations Control Center (TOCC) for the Air Force at Cape Canaveral, Florida. The structure was built to house \$60 million of sophisticated equipment for monitoring and controlling rocket launches at the Cape. The building included 136,000 square feet, special interior design and a complex HVAC system to protect the instrumentation. The project was awarded to W&J Construction for \$17,388,233 in February 1989.

The Partnering process for this project was more complex than the Oliver project because it involved numerous stakeholders. The Partnering Team included five key participants, the Air Force; a separate designer; the builder; an instrumentation contractor; and the Corps as the project manager. The user of the completed facility was the Air Force and the instrumentation of the facility was to be accomplished by another contractor, the Harris Corporation.

The initial Partnering Workshop was held 27-28 February 1989 in Daytona Beach. The same facilitator and workshop process as in the Oliver project were used. There were 24 participants. The contractor for the project was initially wary of the Partnering concept but "became a believer" after the workshop. One of the Mobile project managers identified that he had less favorable experiences with the contractor on another job but that the organization exhibited a "major

change in attitude, and executed a good schedule and managed the subcontractors extremely well."⁹⁴

The project team developed a more detailed problem resolution model than on the Oliver project. The problem resolution process between the Army and the Air Force was seen as vital. Three dispute escalation levels were developed. These were the Project Management Group (PMG), the Senior Advisory Group (SAG), and the Executive Review Group (ERG). The objective was to quickly resolve problems between the two services or escalate the issue to a higher level for a decision. Escalation between groups would happen after a specified period in the hopes that the higher authority find a solution and end the dispute.

The PMG was at the job site level and included the Army and Air Force resident engineers. If there was a dispute that involved the contractor it was brought to the PMG's attention. This group met on a weekly basis and formally once a month when project evaluations were completed. The objective was to solve all disputes that developed at this level. If a mutual solution could not be found the issue was escalated to the SAG.

The SAG represented the next level of military authority for the Corps and the Air Force. It involved the Army's Deputy District Engineer, the Air Force equivalent and a representative of the Corps' South Atlantic Division which overwatched the Mobile District. Problems not resolved by this level were to be escalated to the ERG. The ERG was at the level above the Engineer Division, the Corps

⁹⁴Miller, David, L. Project Manager, Project Management Division, Mobile District, USACE, Telephone Interview 15 Oct 1992.

Headquarters in Washington D.C. This would have involved the authority of a Two Star, Major, General for both services but was never required on this project. The escalation process was designed to avoid letting unresolved issues sit and develop into major problems. There were "no arbitrary or capricious calls at lower levels because they knew the decisions or arguments would have to be substantiated to the higher authorities."⁹⁵

The actual Partnership Agreement between all the project participants for the TOCC is included at Appendix A2, it read as follows;

"We, the partners of the TOCC Project, Agree to work together as a cohesive team to produce a quality job on time, under budget, safely, ensuring a fair profit for the contractors. We will streamline the paperwork process, resolve conflicts at the lowest level and provide a safe work environment. We agree to communicate and cooperate in all matters affecting the project by developing specific action plans to break down communication barriers, improve work change orders and ensure the construction, instrumentation and follow-on operation and maintenance of the TOCC meets the needs of the Eastern Space and Missile Center."⁹⁶

Initial follow-up workshops were not scheduled. Due to the favorable project atmosphere that resulted from the initial workshop

⁹⁵Bonine, Larry, S. Partnering Champion, B/PB, Boston Central Artery/Tunnel Project, Interview, 27 May 92.

⁹⁶USACE, Mobile District, Appendix E.

the participants settled on biweekly meetings at the project site. After ten months some difficulties did arise and the full project team held a workshop in December 1989.

The workshop included the original facilitator. Evaluations of the Partnership were filed by the participants. Overall the process scored well (average 4 out of 5 points) but some low scores were found. The key issues were slow response time to problems and weakened communications between parties. At that time the project was 62% complete, 20% ahead of schedule, 22 value engineering proposals for total of \$375,209 had been submitted and six had been approved for \$106,753.⁹⁷

The project was turned over to the owner 30 July 1990. The interior of the building was completed 5 days ahead of schedule and the exterior 63 days early. The final project cost was \$18,486,559, a 6.3% cost growth due to both owner changes and contractor change order requests. Nine VE proposals were finally accepted. The project manager rated the quality above average. Paperwork on the project was reduced significantly due to the Partnering groups weekly and monthly meetings. These meetings were extremely profitable due to the presence of the instrumentation contractor. "This helped with space details for the equipment". The project was completed without any litigation or outstanding claims.⁹⁸

⁹⁷Ibid, Appendix D.

⁹⁸Miller, Interview 15 Oct 92.

The project manager felt that there were no great problems but that the benefits in "Open communications, the spirit of cooperation, talking to solve issues and the positive attitudes were attributed to the Partnering process." He also emphasized the importance of having a set mechanism to escalate disputes to avoid 3 and 4 month old problems. He felt the project's escalation process was vital.⁹⁹

4.1.3 Bonneville Lock and Dam Project.

The Portland District's first experience with Partnering was on the replacement of the navigation lock at the Bonneville Dam on the Columbia River in Oregon. This extremely complex project has an overall cost estimate of \$330 million and a planned construction period from 1989-1993. It is divided into a number of separate contracts which include five major contractors with a degree of overlapping responsibilities.

This project involves a number of complex issues. The geology is difficult due to unknown subsurface characteristics and a local slide area. The project site is very small and includes two electrical power houses, an existing boat dock, an adjacent railroad, a fish hatchery, a large tourist attraction and a public fishing area. All of these activities had to remain operational throughout the five year project. The Corps identified the need for an extremely high amount of cooperation between all stakeholders in the project.¹⁰⁰

⁹⁹ Ibid.

¹⁰⁰ Jones, Howard, B. "Partnering on the Bonneville Navigation Lock." *Preparing for Construction in the 21st Century*. Proceeding of Construction Congress '91, ASCE, 1991, p. 727.

Three separate contracts that were Partnered on this project include the construction of a \$34 million diaphragm wall on the upstream approach to the lock, a \$5 million well project for the fish hatchery and the \$142 million navigation lock construction.

4.1.3.1 Diaphragm Wall Project.

This contract was the first executed using Partnering in the Portland District. This project was for the construction of a wall protecting the upstream approach to the navigation lock in a known slide area. The construction included huge steel piles and reinforced concrete, producing walls 48 inches thick and 150 feet deep. The construction was in an area where underground conditions were not well known.

The project was awarded to S.J. Groves and Sons in the beginning of 1989 for \$34 million. The Corps District Engineer met with the contractor's Vice President soon after the award and introduced the Partnering concept. To develop the Partnering concepts and a close working relationship both parties sent their key project representative to attend the Stephen R. Covey Center for Principle Centered Leadership. The week long course focused on the elements of Covey's win/win philosophy.¹⁰¹ The Partnering workshop was conducted upon their return and included designers, engineers, managers, attorneys, superintendents, subcontractors and suppliers. The workshop

¹⁰¹Edelman, Carr, Lancaster, *Partnering*, ADR Series Pamphlet 4, USACE, Institute for Water Resources, Dec 1991, p. 11.

was of the typical format and emphasized placing individuals in 'the other person's shoes' to understand their perspectives.

The project team developed as their critical goals; Meet design intent; require no litigation; value engineering objective of \$1 million; limit cost growth to 2% or less; finish 60 days ahead of schedule; do not cause a delay or impact on following contracts; no lost time injuries; administer the contract so all stakeholders are treated fairly; minimize disruption to all Bonneville Lock and Dam facilities and provide safe visitor access.¹⁰² Project evaluations utilized these goals as criteria for quarterly evaluations.

This project was successfully completed in February 1991. The results were very favorable. The project incurred no litigated claims, achieved value engineering savings of \$1.8 million, cost growth was 3.3%, completion was on schedule, there were no lost time accidents and based on other Corps experiences participants identified that paperwork on the project was 2/3 less than other projects.¹⁰³

The stakeholders were proud of their accomplishments. The Corps compared the statistics with other experiences. Past value engineering savings only \$750,000 on a \$310 million project, typical Corps project cost growth of 10% and an industry wide accident rate of 6.9 lost time accidents. The high level of morale of project members was evident but not quantifiable.¹⁰⁴

¹⁰²Jones, p. 731.

¹⁰³Ibid.

¹⁰⁴Edelman, Carr, Lancaster, p. 12.

4.1.3.2 Well Project.

This project was the reconstruction of water wells that fed the Bonneville salmon hatchery. Although the project was of much smaller scale its sensitivity was important to the overall project. This project was awarded to Morrison-Knudsen in October 1989 at a price of \$5 million.

Due to the limited project scale the scope of the Partnering workshop was also limited. The parties conducted a 1/2 day nonfacilitated session. The stakeholders developed very open communications and discussed project goals and procedures. All participants identified their issues and concerns. The short workshop resulted in a good start for the project and identified the key goals.

The project goals were, no damage or contamination of the aquifer; maintain good communications; submittals to be reviewed/returned within two weeks; well operation and maintenance manuals provided promptly; complete the project on schedule and without litigation; cost growth less than 5%; no lost time accidents; obtain an early decision on construction of an optional well; provide a quick response to well screen designs; conduct joint working meetings of the project team.¹⁰⁵

The results of this project were also very favorable. It was completed in January 1991 a month early. The project cost was 4.4% below the budget, there were no accidents, value engineering savings

¹⁰⁵Ibid, p. 13.

were \$72,000, there was no litigation involved and all other project aims were met.¹⁰⁶

4.1.3.3 Lock Construction Project.

The final and largest contract was for the actual replacement lock construction. Due to the experiences on the other projects and the complexity of the lock construction the decision to Partner the project was made early by the Corps. The voluntary Partnering option was identified in the bid specifications and was also presented at the pre-bid conference by the District Engineer, Colonel Charles Cowan. The project was awarded in March 1990 for \$142 million to a joint venture of Kiewit Pacific Company and Al Johnson Construction Company.

The key leadership from the Corps and the contractor organizations met after the award to develop the Partnering concept and initial goals. The Corps resident engineer and the contractor's project manager again attended a leadership school together for a week. The workshop then took place over a three day period from 14-16 May 1990. This facilitated session had 37 participants. The key stakeholders were the Corps and contractor representatives along with the designer, key subcontractors and suppliers. The stakeholder representatives functions included; contract administrators, lawyers, engineers, managers, quality assurance, safety and operations and maintenance personnel.¹⁰⁷

¹⁰⁶Jones, p. 732.

¹⁰⁷Kiewit Pacific Co, Partnering Briefing, pp. 14-15.

The workshop followed the Corps model. Approximately half of the sessions focused on team-building and half focused on identifying overlapping stakeholder goals and objectives to be used in the project mission statement or Partnering Agreement. One exercise to develop group awareness and conflict management involved the interpretation of one of the Ten Commandments. The purpose was to emphasize the views different parties can develop when interpreting any document or construction specification.¹⁰⁸

The prime contractor identified that the workshop activities were important to the development of synergy within the project team. It was stated that "the critical ingredients for this were; interaction and communication skills, appreciative understanding or true listening, integration or the combination of differing perspectives and implementation or the establishment of common goals and evaluation of progress."¹⁰⁹

The top five issues identified during the workshop were 1) maintaining the tight performance schedule; 2) meeting design intent; 3) guarding on-site and public safety; 4) preserving the fish hatchery operations; 5) avoiding litigation.¹¹⁰

The problem resolution model was well developed and included the concept of escalation. The project team set standards for when unresolved issues would be sent to the next higher authority. The

¹⁰⁸Tarricone, p. 72.

¹⁰⁹Kiewit, p. 5.

¹¹⁰Edelman, Carr, Lancaster, p. 14.

contractor identified the importance for "Quick escalation from a level where disagreement exists to a level that has the authority and motivation to solve the problem...Escalation to higher authority that is looking at the big picture for the overall project is very successful."¹¹¹ Examples of this experience will be presented in Chapter 6.

The joint project goals from the Partnering Agreement or Charter are 1) excellence in safety with no fatalities, a lost time incident rate less than 1/200,000 man-hours and no general public liability claims over \$500; 2) quality by meeting design intent, a joint quality management program and building it right the first time; 3) on time lock opening by timely resolution of issues and joint management of the schedule; 4) maintain the integrity of the fish hatchery; 5) value engineering goal of \$10 million for total project savings; 6) no litigation; 7) maximize cooperation and limit cost growth to less than 5%, minimize contractor/subcontractor costs and minimize paperwork, 8) make the project enjoyable through Partnering at all levels, communication and having fun.¹¹² (See Appendix A3).

The project evaluations based on the project goals are completed every three months and semi-annual workshops were planned. The evaluation in July 1991 identified very poor ratings and a downward trend in past evaluations. The poorest scores were in the areas of schedule maintenance, issue resolution and value engineering savings.

¹¹¹Kiewit, p. 35.

¹¹²Ibid, p. 3.

The Partners held a one day session in August 1991 with 40 participants to review the Partnering progress. It resulted in a very open discussion that identified numerous disagreements and problems. Action plans were implemented to address the problem areas. This resulted in a significant increase in evaluation scores in the November 1991.¹¹³

In February 1991 the project was at 29% complete. Construction was on schedule, had a cost growth of 2.5%, exhibited a reduction in paperwork and had no associated litigation.¹¹⁴ In August 1992 the project was approaching 90% complete, value engineering had resulted in a savings of \$3.6 million, there were fewer accidents than in the past, paperwork was reduced because parties were talking rather than writing letters, there were still no unresolved disputes and project completion was still set for 1993.¹¹⁵

4.1.4 J-6 Rocket Test Facility.

The J-6 Test Rocket Test Facility is another example of a project that was Partnered between the Corps' Mobile District, the Air Force and the construction organizations. The project, at the Air Force's Arnold Engineering and Development Center in Tullahoma, Tennessee, involves the construction of a large facility to perform tests on rocket engines for use in outer-space. The complex covers over 80

¹¹³ibid, p. 6.

¹¹⁴Jones, p. 729.

¹¹⁵Burrill, Dan, "New Lock to Make Bonneville Safer, Faster." *Engineer Update*, USACE, AUG 92, p. 5.

acres. This particular project is for the construction of the main test facility that includes a giant vacuum chamber.

This project was awarded through the use of an alternative delivery method and included an incentive award program. Construction of a similar \$400 million test facility had experienced a 50% budget growth.¹¹⁶ Due to the project complexity the Corps implemented a multi-parameter bid process to provide more selectivity in the award process. \$173 million project was awarded to a joint venture between Ebasco Constructors and the Gust K. Newberg Construction Company in November 1989. Due to funding issues in Washington, D.C. the project start was delayed by 147 days, construction actually started in August 1990.

Due to it's complexities the project was a prime candidate for Partnering. After the project award the stakeholders entered into a voluntary Partnering arrangement. The Partnering workshop was facilitated by Management Psychologists, Biede and Boyd, P.C. The participating parties included the Corps as construction manager, the owner Air Force Systems Command, the contractor joint venture, the design firm, and major subcontractors.¹¹⁷ There were nearly 80 participants.

Again the workshop followed the typical Corps agenda. Besides the team building activities major administrative issues covered were "invoicing procedures, shop drawing submittals, the Buy American Act,

¹¹⁶Kemezis, Paul, "Rocket Engine Test Plant Rises." *Engineer News Record*, May 25, 1992, p. 47.

¹¹⁷Ashley, Mark, C. *Partnering*, Master's Thesis, Georgia Institute of Technology, June 1991, p. 56.

request for information, and other contract administration procedures...¹¹⁸

The team goals developed and included in the project Partnering Charter were to be achieved through "open communications, joint problem solving, and teamwork". These goals included 1) a satisfied customer with a quality facility; 2) a safe project with zero lost-time accidents; 3) contract cost growth limited to 2%; 4) award 100% of the award (incentive) fee; 5) completion within respective budget; 6) maximizing value engineering; 7) completion on or ahead of schedule; 8) a total team approach resulting in Outstanding Project Team Performance. The project team highlighted the need to support decision making at the lowest level and maintaining commitment to teamwork, mutual trust, responsiveness, flexibility, and open communication.¹¹⁹ The Partnering Charter is at Appendix A4.

One of the Partners summarized his feeling about the workshop process, "Although I was turned off by the first day and a half, the advantage of attacking anticipated problems well in advance of critical path activities in a non-threatening, non-adversarial atmosphere came through loud and clear. Although the touchy-feely stuff seemed unnecessary at first, it clearly was an expedient method to cut through negative attitudes and facilitate timely communication and teamwork."¹²⁰

¹¹⁸Ibid, p. 57.

¹¹⁹Ibid, p. 55.

¹²⁰Ibid, p. 57.

The project team has overcome numerous problems besides the initial construction delay. As of May 1992 the project was proceeding four months ahead of schedule with an expected completion date of July 1993. There had been no lost time for safety problems, the team had achieved \$2.8 million in value engineering savings and the contractor has the possibility of obtaining \$3 million in incentive fees. One of the project managers for a large subcontractor identified one aspect of Partnering's success on this project. "The concept dramatically reduced lead times, Here we have direct access to people who can make decisions and get an answer in two or three days."¹²¹

4.1.5 Corps Experiences.

The experiences outlined in these six Corps of Engineers contracts represent the most advanced projects and appears to be representative of the successes in other Districts throughout the Corps organization. Favorable results are also being experienced in the Kansas City District on five projects in their initial stages. The Lower Mississippi Valley Division employed the process on a contract for removal of Lock and Dam No.26 and a railroad bridge across the Mississippi River. The Huntington, West Virginia District has used the process on the \$225 million Gallipolis Locks and Dam replacement project. It has also been used on smaller projects such as quarters renovation at Patrick Air Force Base.

¹²¹Kenezis, p. 47.

Most recently, after the end of the Gulf War in January 1992, the Corps' Transatlantic Division Kuwait Emergency Recovery Office (KERO), implemented Partnering between different nations and cultures for the reconstruction of Kuwait's National Assembly Building. Partnering was used on this project to improve the delivery time and reach completion for the planned elections. In October 1992 the project had met all its milestones. The Resident engineer identified, "The single most important thing that contributed to this project's success was communication. That was a result of the Partnership..."¹²²

4.2 The Arizona Department of Transportation.

In June 1991 MR. Charles Cowan became the director of the Arizona Department of Transportation (ADOT). Previously he had been a Colonel in the U.S. Army Corps of Engineers and served as District Engineer of the Portland District where he lead the implementation of Partnering. When he went to Arizona he brought the Partnering concept with him.

The ADOT administers over 125 transportation related projects each year. The state construction contracts total \$400 million and construction engineering accounts for \$30 million annually.¹²³ By the end of 1992 ADOT's goal is to have all their new construction projects Partnered. The agency's primary contract award method is through the competitive bid. Partnering is initiated on a project by project basis after the project is awarded to the low bid contractor. The ADOT has

¹²²Kibler, Joan, "Kuwaiti Parliament Building Completed" *Engineer Update*, USACE, Oct 1992, p.3.

¹²³Arizona DOT, p. 2.

initiated the use of Partnering on the design phases of their projects as well as the construction portion.

The contract authority within the ADOT is decentralized. Resident engineers have the authority to approve changes up to \$50,000. ADOT District Engineers can approve changes up to \$200,000. According to an Assistant District Engineer "This changed policy empowers people in the field...this accounts for 95% of the decisions that would have otherwise stacked-up at the central office causing delays to the contractors in the field."¹²⁴

By March 1992 the ADOT had been Partnering for seven months. In that amount of time 12 projects, worth \$87 million, were using the basic Corps model Cowan used in Portland. The Partnered projects ranged in size from \$900,000 to \$18 million.¹²⁵ As Director, Cowan took the lead as the Partnering Champion for ADOT. He stated "In less than a year, we have put the Partnering concept at the center of everything we do."¹²⁶ In Spring of 1992 ADOT published their first newsletter *Partnering News*.

4.2.1 Arizona Route 87.

One example of the Partnering process at ADOT is the construction of a 5.5 mile section of Arizona Route 87 just outside Phoenix. This project crosses the Verde river, passes through two Native American

¹²⁴Ibid, p. 6.

¹²⁵Tarricone, p. 74.

¹²⁶Arizona DOT, p. 2.

Communities and The Tonto National Forest. The bridge over the Verde River was designed in house by the ADOT and the highway by a contracted design firm. The project was awarded to JWW Contracting at the cost of \$12.3 million. The project has a large number of interested parties that all became Partners at the project's Kickoff Workshop.

The participants in the two day Partnering workshop included the ADOT representatives, the contractor, both design teams, representatives of both affected Native American Tribes and representatives of the National Forest Service. The agenda for the session was similar to the typical Corps program. The participants developed interpersonal skills, focused on project issues were educated in ADOT's program.

A key element of the ADOT program is to compensate design firms for involvement throughout the life of the project construction to ensure they are responsive to design issues or changes that may develop during the construction phase. One project identified the designer's responsibility to respond to design issues within 24 hours.¹²⁷ The agency also employs the Corps escalation or elevation concept in the project problem resolution model. Issues that are not resolved at the lowest levels have restrictions on the amount of time that can elapse before the problem is elevated to a higher authority to reach resolution.

¹²⁷ Ibid, p. 6.

ADOT's Partnering philosophy is made clear during the project workshops. It is for stakeholders to:

"honor a strict code of mutual respect and trust. They will follow a set of rules designed to resolve problems at the lowest possible level and at the earliest possible moment. Project managers will be empowered to solve problems at their level and the project designers will be accessible and compensated during the construction period. All parties will, to the extent possible, share the risks of unforeseen difficulties and divide the rewards of creative efficiencies and accelerated completions. Errors discovered will belong to the group."¹²⁸

One of the designers on the Highway 87 project identified that the Partnering session gained him a new involvement in the project construction phase. The fact that the project team got to know each other and understand overall project goals facilitated post-design changes that saved ADOT and the contractor time and money.

The Forest Service's interests in the project were to ensure the environment received minimal damage. Their interests could cause an extremely adversarial relationship with ADOT and the contractor. By including the Forest Service as a participant in the Partnering workshop the adversarial relationship was avoided. One District Ranger stated, "I was impressed with development of personal relationships during the initial two day session. After you get through with the discussions, sharing of perspectives, and problem identification, the project really can't fail. Everybody bought in, and they are excited."¹²⁹

¹²⁸Ibid, p. 2.

¹²⁹Ibid, p. 3.

The same favorable impact was felt by including the Native American Tribes in the process. This resulted in earlier land access and avoiding an expensive detour. Partnering has been attributed with the contractor's hiring and training some Native American workers for the project as well as the saving of firewood and native plants.

The ADOT resident engineer identified that when the project was shut down due to heavy rains they remained on schedule because Partnering had resulted in the project preceding two months ahead of initial milestones. In the Spring of 1992 the Highway 87 project was 31% complete, it was projected to be 16% ahead of schedule and had saved \$246,000 due to construction engineering and \$75,000 from value engineering efforts.

4.2.2 Arizona DOT Project Status.

The Arizona Department of Transportation leadership believes that it's use of Partnering is saving millions of taxpayer dollars but at the same time the contractors are realizing fair profits and fewer risks.¹³⁰ Other impacts are improved project schedules and safer work sites for employees. The Department feels that improvements to the process will be made over time. One current issue is to start improving the number of subcontractors and suppliers in the project teams.

The statuses of the initial 11 projects in Arizona as of Spring 1992 are shown at Figure 4-2. This figure identifies the time

¹³⁰ibid, p. 1.

improvement, value engineering and construction engineering savings that the ADOT has claimed for each project.

PROJECT TYPE	ESTIMATED COST (MILLIONS)	PERCENT COMPLETE	TIME IMPROVEMENT	VE SAVINGS (x1000)	CE SAVINGS (x1000)
Interchange	\$6.2	86%	53.3%	\$140	\$56
Highway	\$13.8	65%	13%	\$154	\$374
Road	\$5.7	53%		\$39	\$75
Interchange	\$4.7	52%	48.1%	\$21	\$211
Highway	\$3.5	33%	44%	\$51	\$52
Highway 87	\$12.3	31%	16.3%	\$75	\$246
Interchange	\$5.2	24%	20%	\$3	
Road	\$8.5	21%		\$3	\$42
Bridge	\$3.3	20%	10.2%		\$66
Highway	\$4.4	19%	25.6%		\$88
Interchange	\$18.9	10%	22%	\$70	\$474
TOTALS:	\$86.4			\$556	\$1,684

Figure 4-2¹³¹

Many other states from around the country have been visiting ADOT to learn more about the Partnering process and its benefits. The Director MR. Cowan believes in the merits of the process with his combined experience in Arizona and with the Corps of Engineers, "after

¹³¹Ibid, p. 6.

putting the Partnering concept to work on more than 100 contracts worth \$660 million my expectations have been exceeded on every single project."¹³²

4.3 The Massachusetts Highway Department.

The Boston Central Artery and Tunnel Highway Project is a \$5 billion, mega-project in which the state of Massachusetts has hired a single design and construction manager for the life of the project. In this case study the construction manager introduced the Partnering concept to the state highway department.

In 1992 the Central Artery and Tunnel Project (CAT) is the largest urban highway project in the United States. Forty-six design consultants, one hundred construction contractors and hundreds of subconsultants, subcontractors, and suppliers will be involved in this massive undertaking.¹³³ This project will replace Boston's antiquated central artery built in 1950. The old highway system cannot handle the current traffic loads, it is congested and dangerous. The mega-project involves the reconstruction of 7.5 miles of highway cutting through the heart of Boston which will double the current traffic capacity of the north-south Interstate 93 and east-west Interstate 90. The new roads will be an 8/10 lane system with 50% of the construction as tunnels. The project also includes a new 4 lane tunnel under the

¹³²Schriener, October 14, 1991, p. 27.

¹³³Marshal, Donald, W. "Central Artery/Tunnel Project" Speech given at MIT Symposium on Construction Industry in the Northeast: Opportunities for the 21st Century, 13 May 1992. p. 2.

Boston Harbor that will connect the city with the Logan International Airport.¹³⁴

The main Project Management Team includes the actual owner, the Massachusetts Highway Department (MHD), the Federal Highway Administration (FHWA) due to the federal funding, and the state hired management consultant for project design and construction, a joint venture of Bechtel/Parsons Brinkerhoff (B/PB). The selection of the management consultant was accomplished through the use of a multi-parameter selection process based on management, technical and price proposals and a negotiated contract. This is the first project of such scope in which MHD has employed a management consultant. The project team is using a fast track schedule to obtain completion in 10 rather than 15 years.¹³⁵

The actual design and construction of this complex project is estimated to exceed \$5 billion. The process involves numerous phases of construction that will include incremental highway openings. Each phase of the project is organized into numerous work packages; distinct construction, lump-sum contracts awarded to the low bid contractors. The design of each work package is complete before the bid process. The design/construction manager (B/PB) completes 25% of the design before turning it over to a hired Section Design Consultant (SDC) who completes the design and assumes the design liability.¹³⁶

¹³⁴Central Artery/Tunnel Project, *Project Summary*, August 1992.

¹³⁵Marshall, p. 2.

¹³⁶Bonine, Interview 16 October 1992.

A schematic of the major project work packages is shown at Figure 4-3. These project packages range in value from \$1 to \$300 million.

The MHD, FHWA, and B/PB have built an organization based on the project units. "Each project unit has its own staff dedicated to the project including a project manager and managers representing the key disciplines or functions that each entity chooses to retain as their part of the management team."¹³⁷ A broad outline of the project levels and interfaces is shown at Figure 4-4. This identifies the relative organizational structure for the MHD, FHWA, B/PB and a work package contractor. It is important to note that the State Board of Commissioners is the approval authority for ALL contract changes above \$15,000. Approval authority for changes of \$15,000 or less is ONLY delegated to the state's Project Director. NO changes may be approved for any modifications below this level.¹³⁸ It is normal for the contractor's Project Manager to have authority to approve any changes for his organization.

The use of an integrated Computer Aided Design and Drafting (CADD) system was employed to aid in the mega-project's highly complex civil and structural design and development. To enhance the highly complex integration and coordination of the construction of the project work packages, B/PB introduced the idea of Single Project Partnering for the individual contract packages to MHD and FHWA in 1992. A key player in the development of the Partnering Process is

¹³⁷Marshall, p. 4.

¹³⁸Bonine, Interview 27 August 1992.

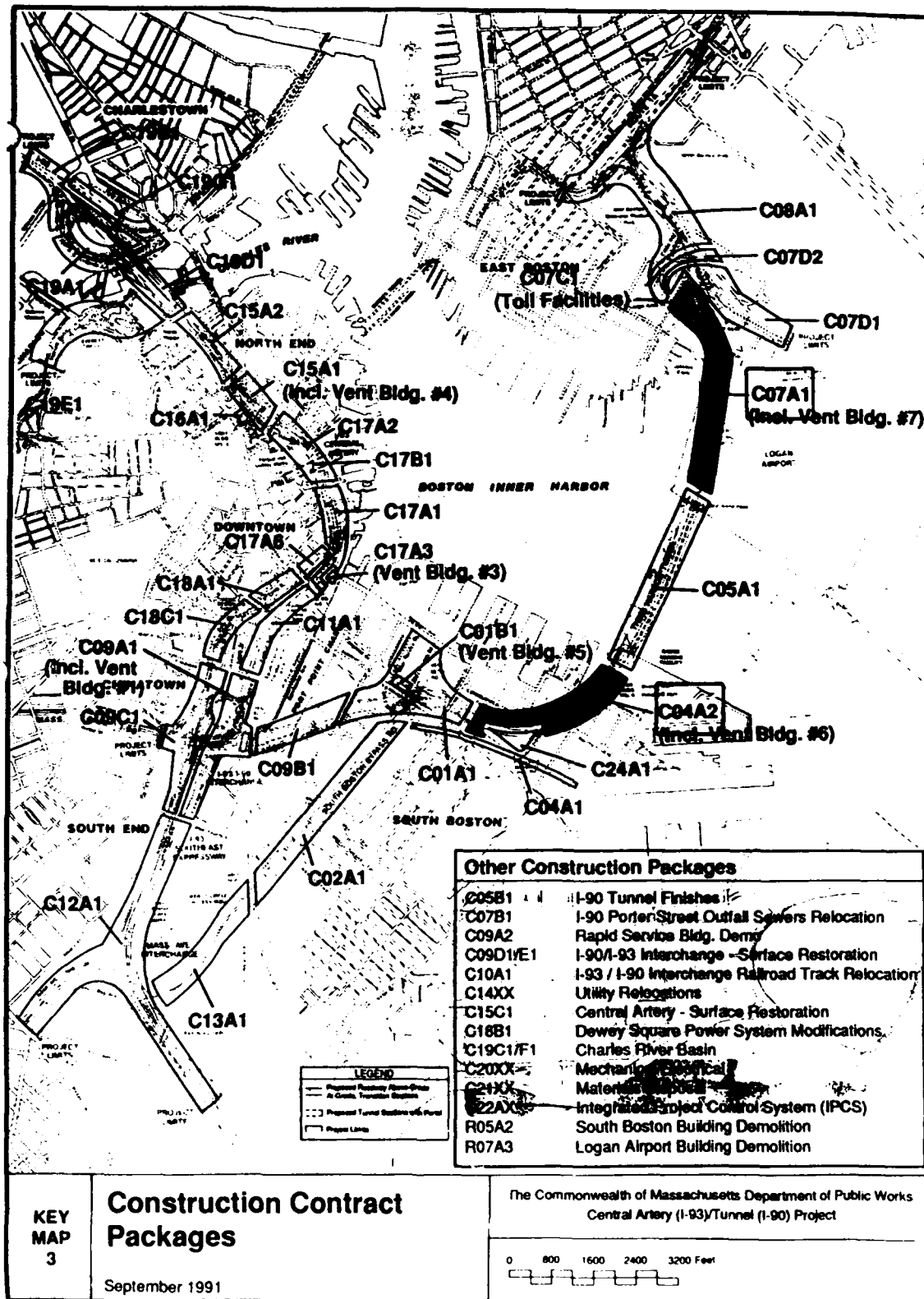


Figure 4-3. Central Artery/Tunnel Construction Packages.

CENTRAL ARTERY/ TUNNEL ORGANIZATION CHART

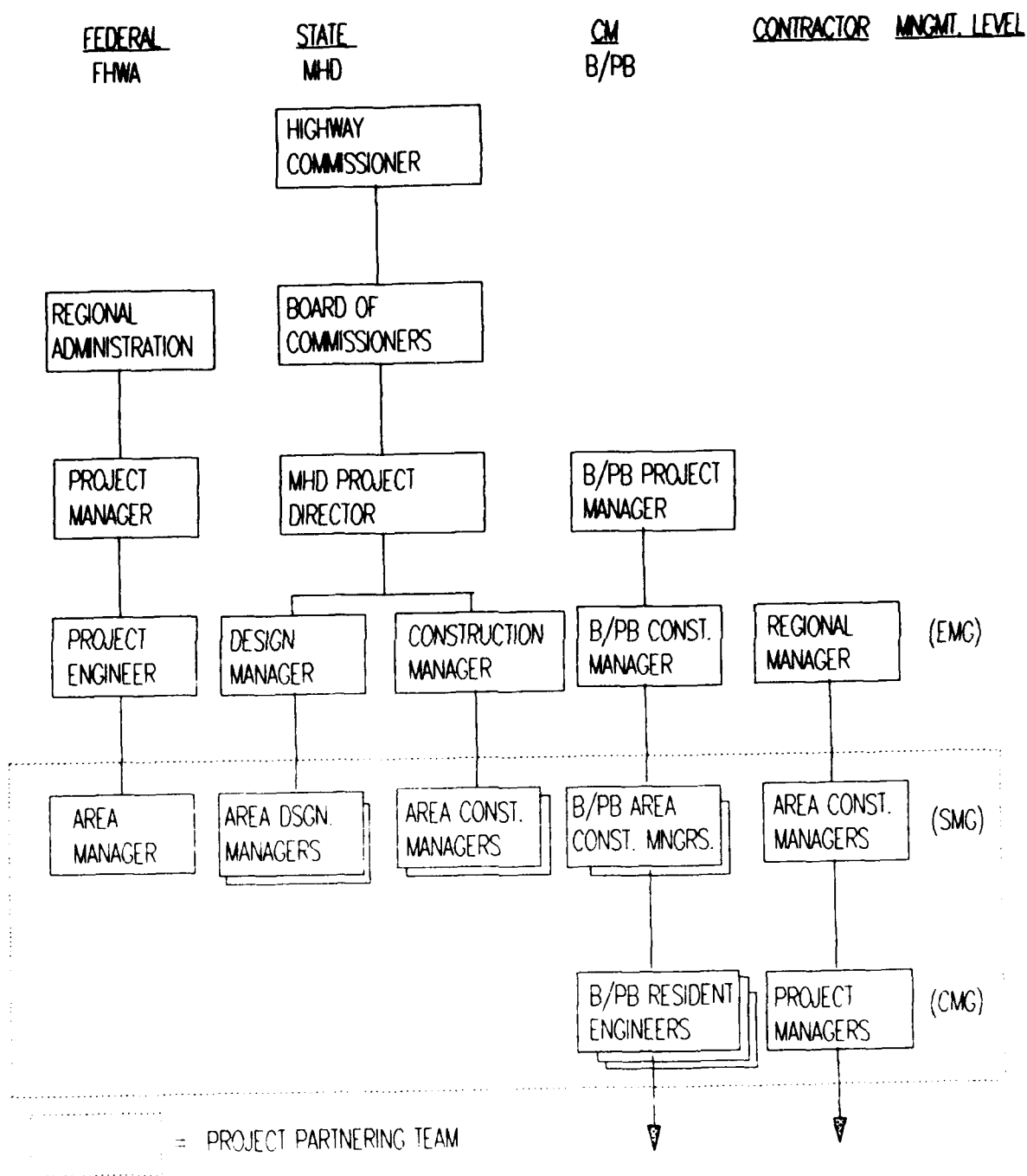


Figure 4-4. Central Artery/Tunnel Organizational Chart.

MR. Larry Bonine an employee of the joint venture team. MR. Bonine is an ex-Army Colonel and was the Corps District Engineer in Mobile, Alabama who oversaw the Oliver Lock and Dam and TOCC projects. MR. Bonine's current title with B/PB is 'Partnering Champion'. He has the overall responsibility for the CAT Partnering Program. The Corps of Engineers Partnering Model is the process being implemented on the CAT Project.

This project provides a unique view of the Partnering process because the concept was introduced by a construction manager not the public sector owner, construction had already begun on some project work packages prior to the decision to implement Partnering and the long-term life of the CAT project may enhance the lessons learned during the 10 year project.

4.3.1 Initiating Partnering.

In March 1992 construction had already begun on numerous aspect of the CAT project. Work package C05A1, the Third Harbor Tunnel, had already been started and had run into numerous problems. The B/PB management felt Partnering could be brought on line successfully due to the phased nature and discrete work packages of the mega-project. The consultants felt Partnering should be initiated on yet started or yet awarded contracts. Prior to initiating any individual project Partnering the owners, MHD and FHWA, had to be educated and support the new concept. First these owners along with B/PB had to develop a true Partnering relationship.

The top leadership of the project owners and the management consultant were introduced to the concept and agreed to develop the process. The education process began with the top leadership of the three organizations participating in a one day Partnering session and through education in the Win/Win principles by attendance at the Stephen R. Covey Leadership School. The Partnering session was held on May 15, 1992 and included 34 participants. Representatives from MHD included the Project Director and 13 other state employees, the FHWA Senior Project Manager and 2 others, B/PB involved the overall Project Manager and 16 key employees.

The agenda for this workshop is shown at Appendix A5. The short session included the basic elements of the Corps workshops. It involved team building exercises, development of issues, objectives and goals. The project management then developed action plans for achieving their overall project objectives. The Participants experienced for themselves the basic elements of the Partnering process and made the decision to implement a Partnering program.

Ten members of the project team attended the Covey Leadership School. The participants included the top leadership, the Project Director from MHD and the Project Manager from B/PB. Each person attended with 4 key staff members from each of their organizations. The leadership school was conducted in Boston. The course focused on the elements of Covey's book discussed in Chapter 3 of this thesis.

4.3.2 Central Artery/Tunnel Partnering Structure.

There are four important aspects of the CAT Partnering structure that must be understood; the contractual clause added to specifications offering the option to Partner work, the level at which the work package Partnering teams were formed, the process for approving contract changes or modifications and the process for escalating an actual project dispute.

The original contract specifications had not provided for Partnering on the Central Artery project. In March 1992 a change was added to the specifications that offered the Partnering option to prospective bidders. Like the Corps process the clause stipulated a voluntary process in which participants would share the cost. The CAT clause is shown at Appendix A6.

The relative organizational structure for the key project participants was introduced in Figure 4-4. The decision was made that the actual work package Partnering Teams would include the Area Construction Manager level and below. The Partnering workshops would include these key participants. This was the lowest level at which all key stakeholders including the FHWA would have representation. The symbolic signing of the Partnering agreements would include the top organizational leadership of all parties; the project director for MHD, project managers of the FHWA and B/PB, and the principle in charge of the contractor's company.

The process for approving a contract change or modification (also referred to as a claim by some stakeholders) is through the basic hierarchy shown in Figure 4-4. The process involves a great

bureaucracy including designers, cost accountants and key managers, the details will not to be addressed here. The important issue is that it is initiated at the project level between the resident engineer and the contractor's project manager and put into the approval process. Although the resident engineer has no legal authority the state's project director is committed to push responsibility for developing changes to his resident engineers.

The resolution of disputes that develop uses a separate process. The contractual specifications stipulate that unresolved disputes will be brought before a three member Dispute Resolution Board with non-binding decision authority. Each contracted work package forms such an ADR team. The board's composition is one member selected by each the contractor and the construction manager who in turn select a third non-partisan member. The boards meet informally once a month and formally every two months.

As previously discussed, the Partnering process calls for a problem resolution methodology. On the CAT project this includes the escalation of any unresolved disputes, to progressively higher levels of authority with the aim of resolution of the problem by the Partnering team. The leadership in CAT developed such a Partnering management structure. The CAT Partnering Champion stated, "If a problem reaches the level of ADR (the Disputes Review Board) the Partnership has failed."¹³⁹

¹³⁹Bonine, Interview 23 June 1992.

The Partnering Management Structure identifies three key management groups with specified responsibilities. The actual work package Partnering teams decide on the escalation times to each group as one of the goals of their own Partnering agreement. The Management Groups on the CAT are similar in structure to the escalation process used on the Corps' TOCC project¹⁴⁰ discussed earlier. However, the CAT process includes the contractor in each group.

The overall responsibility of the structure according to the CAT specification is "...to insure timely decisions, overview, solve problems before they are problems and to give guidance to the team."¹⁴⁰ The three levels of management are the Construction Management Group (CMG) Partnership, the Senior Management Group (SMG) Partnership and the Executive Management Group (EMG) Partnership.

The CMG is the project level of management. The members manage all issues involving the work package design and construction. The members are the B/PB resident engineer for construction, the B/PB project engineer for design, the section design consultant and the contractor's project manager. They meet formally once a month and informally on a weekly basis. Their overall objective is to resolve all problems.

The second level is the SMG. The members include, the FHWA area engineer; MHD, B/PB and contractor area construction managers; MHD and B/PB area design managers; and the CMG members. This group meets every three months or as required to review project activities and issues.

¹⁴⁰Bonine, Larry, S. *Partnering Management Structure*.

The final level before the ADR board is the EMG. It's members are, the FHWA project engineer; MHD and B/PB construction managers; MHD and B/PB design managers; the contractor regional manager; the SMG and the CMG. The EMG meets only as required or identified by the SMG.

4.3.3 Work Package C04A2, Third Harbor Tunnel, West End.

Work package C04A2 is the construction of the west end of the four lane, third harbor tunnel as it emerges into South Boston. This is a \$179 million contract with a notice to proceed date of 21 May 1992 and a programmed completion date of December 1994. The project was awarded to a joint venture of four construction companies who agreed to employ the Partnering concept. This was the first project Partnered on the CAT project.

The initial step in the CAT process is for the education of key project leadership. The area managers of both MHD and B/PB attended a leadership school. They represent the highest level of the project team that are active participants in the work package Partnering process. The B/PB resident engineer and the contractors project manager also attended a leadership school together prior to the project workshop. The aims of these schools are the same as the previously discussed projects. The education of these principle players provide them with a better understanding of the basic principles embodied by the Partnering concept, improve their

contributions to the effectiveness of the workshop as well as establish a close working relationship before construction begins.¹⁴¹

The initial Partnering session for this project was held at a hotel outside the Boston area over two days, 28-29 May 1992. There were 21 participants in this facilitated workshop. The owner's team had 13 members including MHD, FHWA and B/PB. The general contractor had 8 representatives. As the Partnership progresses the intent is to include key subcontractors and representatives of adjoining contracts in future sessions. These participants included all the members of the Construction Management Group and members of the Senior Management Group. The actual list of participants is shown at Appendix A7.

The workshop process matched the Corps model. The session employed an out of state facilitator, practiced in the Partnering process. The first day introduced the concepts involved in the Partnering process, personality traits and the analysis of the stakeholders top five issues. The facilitator used exercises and demonstrations of group interaction, synergy and development of mutual goals to broaden participants understanding of the process. The Myers-Briggs personality-type test was used to emphasize that all the team members have different backgrounds and personalities. This expressed the need to understand that different people interact or communicate in different ways. Due to this, management must be carried out in a more enlightened manner.

¹⁴¹Bonine, Interview 27 August 1992.

The presentation of project concerns was known as the Force Five Analysis. The different organizations, owner and contractor, developed lists of what they saw as positive and negative aspects of executing the project. Each team identified their most critical five issues for the work package.

The second session included developing the problem resolution model for the project, the action plans to address the project concerns, common team goals and development of the team charter. The project evaluation method to include a team grade sheet was developed. The group dynamics were improved throughout the session.

The problem resolution or escalation process was developed based on the CAT Partnering Management Structure it is shown at Appendix A8. The team identified the escalation times for unresolved issues. The teams detailed analysis identified escalation plans for the field, engineering and administrative divisions. Field problems are to be escalated to the resident engineer/project manager level within 48 hours while engineering and administrative disputes have a 72 hour elevation time. The goal is to elevate issues to the CMG and then the EMG within 48 hours each. If necessary escalation to the ADR level would be accomplished within one week.

The developed team goals are shown in the Partnering Charter at Appendix A9. A summary of the shared team goals for the project are, to comply with the time lines stipulated in the problem solving process; solve all disputes at or below the level of the SMG (Court of Last Resort); have no unresolved claims; exceed the national industry safety standards by 20%; achieve value engineering savings of

\$2 million; meet AA/EEO goals; meet or beat project milestones; settle all modifications (PCNs) within 60 days; and nurture the Partnering process. All the participants of the Partnering workshop signed the Charter.

The Partnering evaluation form for the project team is shown at Appendix A10 and A11. The evaluation criteria are clearly based on the elements of the Partnering Charter. All of the goals included in the agreement are elements of the evaluation sheet. The project team applied weights to each of the criteria, identifying the most important goals of the project team. The top three issues are Communication on Changes, Unresolved Disputes and Schedule. The evaluation period is every three months.

The Partnering team planned follow-up sessions at six month intervals. The team also identified the need to conduct a make-up session for new project personnel. The make-up session will be conducted through a joint effort of the resident engineer, project manager and CAT Partnering Champion.

4.3.4 Work Package C07A1, Third Harbor Tunnel East End.

The C07A1 Contract is for the construction of the east end of the third harbor tunnel as it emerges at Logan Airport in East Boston. It is referred to as the Bird Island Flats Tunnel. This is a \$240 million contract. The notice to proceed was issued on 1 July 1992 and the planned completion date is December 1994. This lump-sum bid was awarded to a two company joint venture. It was the second work package Partnered on the CAT project.

The structure of the Partnering process did not vary from the initial project. Both the resident engineer and the project manager attended a leadership school prior to the Partnering workshop. The two day, facilitated workshop was held 31 June and 1 July 1992. While the workshop agenda was the same as the initial project session, this project involved a larger number of stakeholders. There were 50 participants. MHD and the FHWA were each represented by one person, B/PB had 11 members and the prime contractor joint venture had 20 personnel. This session included 6 representatives from the design firms, 4 members of a key subcontractor and 7 members of Massport, the airport authority. The list of attendees is at Appendix A12.

Products of the Partnering workshop included, the dispute escalation or resolution model, the Partnering Charter and the evaluation worksheet also enclosed at Appendix A13-A15. The dispute escalation plan differed slightly in detail and escalation times from the west tunnel project. Problem escalation to the CMG is limited to 48 hours, 72 hours to the SMG and an additional 72 hours to the EMG.

The Partnering Goals were much broader than the first project. The agreement identifies the need to practice cooperation, dedication, flexibility, integrity and pride to obtain goals in the areas of safety, cost/schedule, positive public perception, quality, communication and impact mitigation. These broad goals are still the basis for the project evaluation worksheet. The evaluation form provides a more detailed list of criteria for evaluating the project and provides more insight to the actual objectives of the project team. This team did not weight the evaluation criteria to emphasize

priorities. The evaluation will still provide a picture of how effectively project personnel feel the Partnership is achieving their goals.

A survey of the initial Partnering session was conducted for this project. The workshop participants completed questionnaires at both the beginning and conclusion of the two day session. Eight questions, ranked on a scale from 1-5, addressed participant's perceptions of project communications, problem resolution, cooperation and team work. The results show a positive shift in the attitudes of the team members and is represented graphically at Figure 4-5. The results for all participants showed an average score of 2.98 increase to 4.43 a increase from the initial score by 49%. Individually the greatest shift in attitude was 58% by the owner's side, the least was 41% by the subcontractor. Summary statements by all participants were also positive. The Questionnaire and results are shown at Appendix A16-A19.

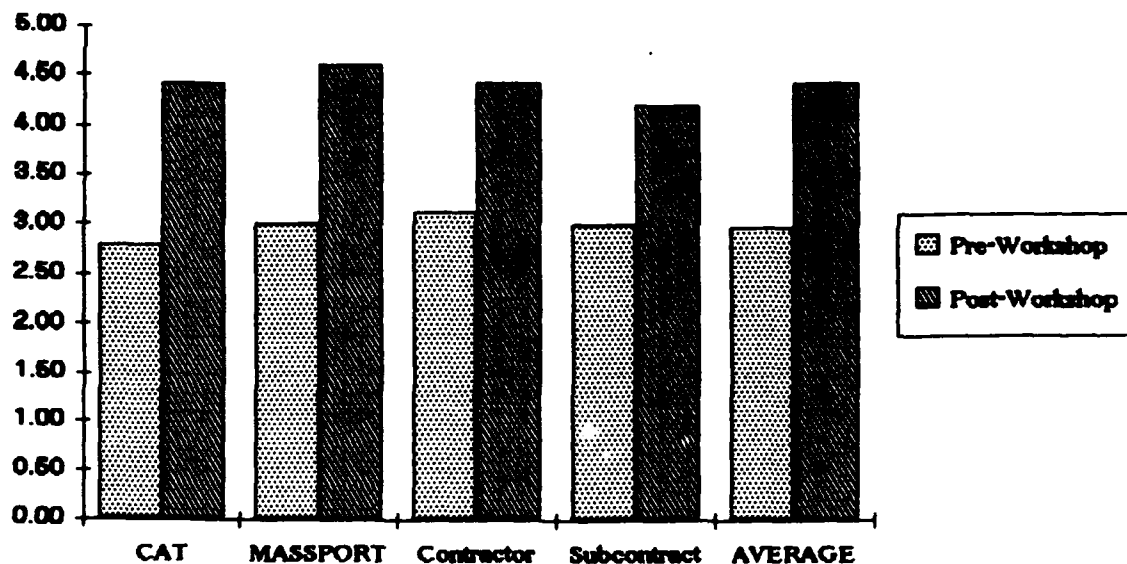


Figure 4-5. Work Package C07A1, Initial Workshop Survey Results.

The team will conduct six month follow-up sessions. On 8 October 1992 the project team conducted a make-up session for new project personnel. This one day seminar involved 15 participants, including 3 owner site personnel, 3 contractor personnel and 3 members of the design team. The session was conducted by the resident engineer, project manager and CAT Partnering Champion. It covered the basic issues developed during a typical Partnering workshop in a condensed form. Major subjects included, personality tests, discussions of how the participants expected to treat one another at work, Covey's principles of listening and win/win, leadership skills, trust and project goals.

4.3.5 Project Status.

The discussion of Partnering on the Central Artery Project provides the details and products associated with initiating the Partnering Process. Although long term results cannot be forecasted dynamics and initial impacts of the process can be seen. Responses to the initial three month evaluations have been fair. While the initial response rate has been only 50% this is explained due to the fact that they were not completed in connection with a follow-up session. All members will complete evaluations at the six month workshops. The majority of the evaluations have average scores of 4 points for most criteria. Issues including submittals, handling of changes, and value engineering on the south tunnel project have identified weaknesses with scores of 3 points. The Partnering Champion feels that though it

is still very early in the project lives, the process appears to be working well within the job sites.¹⁴²

There are some key issues that are currently affecting the Partnering process. The Champion has identified that there are a lot of pressures on the mechanics of the process. He attributes most of these pressures to issues that are levels above the Partnering teams. These include the large scope of the project and the early stages of acceptance of the new concept of Partnering.

Key pressures may be attributed to extreme bureaucracy. This includes the mega-project size as well as the characteristics of the public sector agencies and the large construction management operation. The vast number of project interfaces with adjoining contracts requires a great deal of coordination which requires valuable time and resources. The acceptance of the Partnering concept by key leadership takes time and has not happened to the extent that it may as the project progresses. The level of decision authority for changes is a major issue. Low level managers are still learning what authority they possess. The requirement for managers to constantly check on issues with upper management puts a strain on relations at lower levels and slows progress.

As of October 1992 a current issue is the involvement of the City of Boston in the project Partnership. An adversarial relationship is known to exist between some state and city officials. The project has a major impact on the city and involving city officials in the

¹⁴²Bonine, Interview, 16 October 1992.

Partnering process is expected to occur. The effect of political rivalries due to past and present administrations will make this a very interesting challenge for the Partnering concept.¹⁴³

With these pressures a critical task is the nurturing of the Partnering atmosphere throughout the Mega-project. This is something that must be pursued after the completion of the initial workshops and is a key issue that the Partnering Champion manages. Actions to take at this point are not clear but are developing based on project needs and personalities. While the process was introduced at the workshops the progress and execution is in the hands of the project work package personnel. The nurturing idea must address how to subtly keep the process on course, not through high scrutiny by Partnering executives nor by waiting until major problems have hurt the partnership. Some ideas on the CAT project are the use of lunches, steering committees or the integration of new personnel in mini-workshops as seen by the two project examples. These processes may help maintain the visibility of the Partnering commitments made at the initial workshops and maintain the Partnering process.

4.4 Partnered Project Summary.

The nine project case studies presented in this chapter were selected based on the Partnering process used and the availability of information. The studies covered a broad range of categories varying in owner organizations and project characteristics. A summary of the

¹⁴³Ibid.

project characteristics is provided here to review the wide variations. This is important to appreciate the flexibility of the Partnering process and for the analysis in the next chapter.

The public sector projects included large civil projects. These were the Oliver and Bonneville lock and dam reconstruction and technically complex buildings in the TOCC at Cape Canaveral and the J-6 Rocket Test Facility. The more specialized construction of the Bonneville Fishery Wells and the Diaphragm Wall to overcome complex geological problems. Finally the ADOT and MHD highway projects which included roads, overpasses, bridges, and large tunnel projects.

The Corps of Engineer projects varied in size from \$5 to \$173 million contracts. Four projects were 100% complete, one was at 90% and one at 60%. The Arizona Department of Transportation projects varied from \$3.3 to \$18.9 million. The stage of the projects ranged from 10%-86% complete. The Massachusetts Highway Department Central Artery/Tunnel projects provided detailed information on the initial project workshops and start-up activities. These two newly started projects were \$179 and \$240 million contracts.

The case presentations provided information regarding all nine project Partnering processes, goals and results at various stages of completion. They also provided valuable information regarding project decision authority, impressions of Participants of the Partnering workshops, Partnering agreements, problem resolution methods, evaluation processes and the role of the Partnering Champion. The views expressed were those of public sector owners, designers and private sector contractors.

PARTNERING ANALYSIS

The purpose of this chapter is to continue the analysis of the Public Sector Single-Project Partnering Process begun in Chapter 3. The analysis includes the general process but focuses on the case studies of the Partnering applications presented in Chapter 4. The analysis includes four phases, identification of beneficial trends from the Partnering case studies; discussion of why Partnering can produce these benefits; a summary of critical barriers to the process; and a summary analysis using the System Model.

The first section of this chapter presents the beneficial trends quantified through the results of the Partnered projects presented in Chapter 4. Where information is available additional data from public sector Partnering experiences is presented to reinforce statistics. The positive trends identified directly contrast with the negative effects typically associated with the traditional, adversarial relationships discussed in Chapter 2.

The second phase of the analysis identifies why the Partnering process can produce in these beneficial results. The discussion focuses on the ability of the Partnering process to reduce the typical adversarial relationship by improving the attitudes of parties and reducing risks typically associated with the construction industry.

The third section of the chapter summarizes critical barriers that must be overcome to make the Partnering concept work. The

analysis summary applies the Dispute Resolution System Model to the results of the chapter's analysis.

5.1 Benefits of Partnering.

The Corps of Engineer's overall goal in implementing their Partnering strategy has been to improve efficiency, conserve resources and increase the effectiveness of federal dollars. In construction contracts this translates into objectives in the areas of project schedule, budget, safety, quality and disputes minimization.¹⁴⁴ The Partnered projects studied have realized benefits in all of these categories.

In a speech at the annual CII conference in August 1991 Lester Edelman, the Chief Counsel for the Corps of Engineers identified significant benefits of the Partnering process.

"Initial results from the use of Partnering are quite encouraging. Where Partnering principles have been utilized, we have experienced better cost control, a reduction in cost growth, a significant reduction in paperwork and successful attainment of our value engineering objectives. However most importantly, none of the contracts using Partnering have resulted in litigation. Also other positive by-products have been realized - no late deliveries, no fatal accidents, a reduction in lost-time accident rates and a reduction in the amount of rework."¹⁴⁵

By October 1992 the Corps had applied the Partnering concept to over 100 construction contracts. While many of the contracts were still in

¹⁴⁴Brubaker, p. 736.

¹⁴⁵Edelman, pp. 12 & 13.

the early execution stages the positive trends still stand. The most significant result over the past four years is that none of the contracts have resulted in litigation.¹⁴⁶

The benefits identified by Mr. Edelman are evident in the sample of Corps and Arizona Department of Transportation projects presented in Chapter 4 and will be quantified in this chapter. Although the use of Partnering on the Central Artery project is still in its initial stages, the project goals are in the same areas and initial benefits have been realized in the positive attitudes resulting from the initial project workshops.

The following sections present a quantitative comparison of results from non-partnered and Partnered projects. The trends exhibit that Partnered projects obtained benefits in the areas of Delivery Time; Project Costs; Value Engineering; Safety; Reduced Bureaucracy; and Litigation. These results are evident from the case studies presented and through other organizations' experiences.

5.1.1 Project Delivery Time.

On Partnered projects schedule growth has been virtually eliminated, project deliveries were on-time. Of the six Corps projects presented four were 100% complete. All four were finished on or ahead of schedule and the two ongoing projects were still at or ahead of milestones. The Oliver Lock and Dam and Bonneville Diaphragm Wall

¹⁴⁶Edelman; Carr, "Partnering", *Engineer News Record*, Special Advertising Section, Oct 19, 1992, pp. 33-36.

projects were completed on schedule, the TOCC was turned over 5 days ahead of schedule although exterior construction was completed 63 days early. The Bonneville Well project was completed 30 days early. The J-6 Test Facility had overcome a 147 day delay and was estimated to be moving 4 months ahead of schedule. These schedule results are significant to the Corps.

A study at the Kansas City District compared 13 small, non-Partnered projects worth approximately \$12 million with the early results of 5 Partnered projects totaling \$56 million. They expect to eliminate time growth on the Partnered projects. This is a reduction of 26% compared to their non-Partnered projects.¹⁴⁷

The Arizona Department of Transportation tracks the time improvement on Partnered projects. Their initial 11 projects show an average time improvement of 22.9%. The Route 87 project shows a 16.3% time improvement. This project overcame significant delays due to rain. In the Spring of 1992 it was two months ahead of project milestones.¹⁴⁸

All of the projects reviewed identified schedule maintenance as a key team goal. On the Bonneville project the team members agreed to meet after the initial workshop and hold a week long team session to find ways to maintain the complex project schedule. "Extensive brainstorming was done by interested, knowledgeable people on both

¹⁴⁷Hills, Jeffery, W. "Partnering for Profit", *The Military Engineer*, Vol 84, No. 552, Sept/Oct 1991, p. 49.

¹⁴⁸Arizona DOT, p. 6.

sides. They identified alternative schemes and ways to build in or recover needed contingency time."¹⁴⁹ The project manager for the TOCC identified that Partnering and the escalation process reduced decision cycles and kept the project on track. The resident engineer for the Kuwaiti Parliament Building identified the successful schedule was achieved due to communication and the project Partnership.

5.1.2 Project Costs.

Partnering has affected project costs both directly and indirectly. It has directly contributed to the reduction of project cost growth and aided in meeting estimated project delivery costs. Indirectly it is credited with reducing contractor bids on future projects through the elimination of the 'Hassle Fee' typically associated with bureaucratic public sector projects.

5.1.2.1 Delivery Costs.

The Corps states that typical cost growth experienced on lump-sum, civil construction projects is 10%.¹⁵⁰ The average of the cost growth experienced to date on the Oliver, TOCC and three Bonneville projects is 2.8%, a reduction of 70%. The Portland District maintains that throughout their Partnering experiences they have realized an 80-100% reduction in cost growth.¹⁵¹ In the Kansas City District's study

¹⁴⁹Geary, Richard. "Contractor View of Partnering on the Bonniville Lock." *Preparing for Construction in the 21st Century*. Proceedings of Construction Congress '91, ASCE, 1991, p. 741.

¹⁵⁰Edelman; Carr, p. 35.

¹⁵¹Cowan, p. 721

of smaller projects they anticipate Partnering will reduce cost growth by 2.65% from 4.24% to 1.6%.¹⁵²

In general MR. Cowan, Director at ADOT believes the costs savings are significant. From his experiences he states, "We can never really know all the mistakes that were avoided through this higher level of communication and cooperation. Our best guess is that 2-3% dollar savings are possible through Partnering. The more complex the project, the greater the potential for savings."¹⁵³ On the 11 ADOT projects cost savings of 2.5% were attributed to value and construction engineering savings alone. For savings in this range the costs of the project workshops are minimal for the rewards received.

The cost saving may be attributed to a number of different aspects of Partnering. One consultant claims, "Administrative costs are reduced because defensive case building is eliminated and claim administration and defense costs are avoided."¹⁵⁴

Maintaining project budgets has been a goal on all the projects presented. One contractor on the Bonneville project stated the mitigation of costs is one of the major benefits he had seen, "Many times in an average contract relationship money is spent that doesn't need to be spent. Once it is spent, somebody is stuck with it - either the Owner or the Contractor or both. In the better 'give and take' atmosphere of Partnering, this should not happen. Changes and effects

¹⁵²Hill, p. 48.

¹⁵³Arizona DOT, p. 5

¹⁵⁴Bainbridge, L, R, & Abberger, W.A. "Partnering: Working Smart in the 1990s." *Construction Business Review*, September/October 1991, p. 46.

of actions can be debated out quickly, with hard spots routed out and dealt with so unnecessary expenditures are not made."¹⁵⁵

5.1.2.2 Reducing the Hassle Fee.

When contractors bid on public sector construction projects owners believe the contractor will normally add an additional contingency to the lump-sum bid to account for the extra bureaucratic 'hassles' they will encounter due to regulations and paperwork on state or federal jobs. This contingency has been referred to as 'the hassle fee'. When a contractor experiences a successful, Partnered project that is a profitable, amiable experience he will find he can reduce his contingency or hassle fee on a subsequent bid for a Partnered project. This will help to assure project award.¹⁵⁶

A contractor substantiates this idea in terms of an owner's reputation for litigation. "Some owners don't have a record of big litigation costs but many have a bad reputation of being hard to deal with-Contractors bid higher or don't bid to them."¹⁵⁷ A contractor that has done work with the ADOT stated, "Partnering makes you feel more comfortable in dealing with ADOT. You know they're going to work with you. I think some companies will take that into consideration when they put together a bid."¹⁵⁸

¹⁵⁵Geary, p. 742.

¹⁵⁶Bonine, Interview 27 May 1992.

¹⁵⁷Kiewit, p. 8.

¹⁵⁸Arizona DOT, p. 4.

This idea stems from the belief that Partnered projects are less of a risk for project stakeholders. While with the Corps Portland District Colonel Cowan identified that "The value of shared risk is that we get lower bids,".¹⁵⁹ Officials in Arizona feel that due to reduced risk, safer projects, finished earlier and at lower costs, "...there was general agreement that contractors can afford to bid a Partnered job lower than a non-partnered job."¹⁶⁰ The leadership at ADOT feels that one of Partnering's greatest future benefits will be "...in lower bids, through elimination of "the hassle Factor", which is typically built into the bid."¹⁶¹

5.1.3 Value Engineering/Constructability.

The Corps of Engineers accepted 1200 contractor value engineering proposals totalling \$38 million from 1986-1989.¹⁶² During the mid-1980's the Corps was averaging more than \$9 billion of military construction annually.¹⁶³ Thus the percent of value engineering savings was miniscule. Five of the Corps projects presented identified value engineering goals in the Partnering agreements. \$8.4 million in value engineering savings have been achieved on the \$369 million

¹⁵⁹Schriener, Judy. "Contractors Decry Tight Money and Bonds." *Engineer News Record*. October 18, 1990, p. 12.

¹⁶⁰Arizona DOT, p. 2.

¹⁶¹Tarricone, p. 74.

¹⁶²Brubaker, p. 736.

¹⁶³Ichniowski, "Taking the Corps by Storm.", p. 17.

contracts a ratio of 2.3%. The Portland District identified that one comparable \$310 million civil contract had achieved only \$750,000 or 0.2% in savings.¹⁶⁴ While the Bonneville Lock project has attained \$3.6 million in value engineering savings it is behind it's very ambitious \$10 million goal.

Value engineering savings experienced by ADOT on their initial 11 projects has been comparable to the Corps experience. The 11 projects totaling \$86 million have realized \$556,000 saving due to value engineering (before construction) and another \$1.7 million due to construction engineering savings. This \$2.25 million is 2.6% of the contract costs. The ADOT Partnering manager estimates that, "Value engineering savings possible through early Partnering can be as much as 1%. When the designers and the engineers sit down with the people who will actually build a project, some amazing savings are possible."¹⁶⁵

Open communications and trust on the Partnered projects produces an environment more conducive to innovation. The team effort produces a better chance to identify problems early and save time and money by developing team solutions. When the designer is a member of the Partnered team there is a better interpretation of the design. The early identification of design problems also helps to lower possible design/engineer liability risks.

¹⁶⁴Jones, p. 731.

¹⁶⁵Arizona DOT, p. 5.

5.1.4 Project Safety.

Safety of workers on construction sites is a major industry issue. The current industry-wide accident rate for construction is 6.9%.¹⁶⁶ An examples of good experience on a public sector construction project is the new National Archives Building in College Park, Maryland where injuries have been 4.3 per 200,000 work-hours.¹⁶⁷ A very poor example is the Los Angeles Metro Rail project, the Red Line Segment's recordable and lost-time incident rates may have been twice as high as the reported rates of 23.75 and 10.27 per 100,000 work-hours.¹⁶⁸

Corps projects typically have low accident rates but Partnered projects have experienced rates well below the industry average. Project goals have ranged from less than one per 200,000 hours to none. The Oliver project reported one lost-time accident over the full contract, the TOCC had two at the job site and one traffic accident. The Bonneville Diaphragm Wall and Well projects and the J-6 project have reported no lost-time accidents. The accident rate on the Bonneville lock has been less than in the past. These reduced accident rates have been attributed to the overall work environment as well as the commitment of the project team to meet safety goals.

¹⁶⁶Edelman; Carr, p. 35.

¹⁶⁷Ichniowski, Tom, "History Overpowers Archives Job", *Engineer News Record*, August 3, 1992, p. 28.

¹⁶⁸Korman, Richard, "Accident Reports off Mark", *Engineer News Record*, August 3, 1992, p. 10.

5.1.5 Reduced Bureaucracy.

Members of Partnered projects have quantified this benefit in terms of reduced paperwork but may also be described in terms of reduced administrative costs discussed in section 5.1.2.1. The reduction in paperwork has been significant on Corps projects. A two thirds reduction has been claimed by the Corps and the Portland District substantiates this from the results of the three Bonneville contracts.¹⁶⁹

Two reasons for the reduction are the ability of team members to discuss issues openly rather than write formal letters and because the Partnering relationships have developed trust which has reduced or eliminated the need for parties to document every issue and leave a 'paper trail' to support a claim or litigated settlement. The Corps assistant resident engineer on the Bonneville Lock project stated, "We don't have as much paperwork because we talk rather than sending letters."¹⁷⁰ A contractor on the project identified that, "Our project manager told me he's relieved he doesn't have to sit down and compose those nasty, posturing-type letters."¹⁷¹ On the TOCC project the Corps project manager identified that the regularly scheduled team meetings were responsible for a significant reduction in project paperwork. The Corps record of no litigation on any Partnered project speaks to the reduced need for defensive paperwork by any party.

¹⁶⁹Cowan, p. 721.

¹⁷⁰Burrill, p. 5.

¹⁷¹Tarricone, p. 73.

5.1.6 No Litigation.

The greatest benefit connected to Partnering is the fact that none of the Corps of Engineers 100 experiences have resulted in litigation. At ADOT it is still early in their program but there are no signs that litigation will be an issue on their projects. The cost savings of this benefit are difficult to quantify but they should be significant. The direct administrative costs associated with legal fees and case development as well as the indirect costs of lost productivity and wasted time could be staggering.

It would be false to say that there are not significant issues between parties. But the resolution process allows for fair, quick settlement. "Most would agree that Partnering reduces the exposure to litigation through communication and issue resolution strategies."¹⁷² On the Oliver Lock and Dam project the Corps District Engineer and the CEO of the contractor's company settled a large (\$2.4 million) claim and avoided costly litigation. Partners tend to feel committed to avoid even the use of ADR. The goal is to settle issues within the Partnered team at the lowest level possible.

Another benefit relates to the exposure of the design/engineer to litigation. The AGCA claims the designer has "Minimized exposure to liability for document deficiencies through early identification of problems, continuous evaluation, and cooperative, prompt resolution which can minimize cost impact."¹⁷³

¹⁷²Bainbridge, p. 45.

¹⁷³AGCA, p. 3.

5.1.7 Benefits Summary.

The discussion of Partnering benefits has focused on the quantifiable results experienced on ADOT and Corps projects. Another benefit that is continually mentioned is quality. While this category is harder to quantify project participants feel the delivery of quality construction has been improved based upon individual experiences on multiple projects. The Corps Project Manager for the Oliver project stated that even with the contractor's financial problems the quality was still excellent, very high. The Corps representative for the TOCC stated quality was above average.

Quality can be measured in terms of the physical product as well as on the human dimension of job satisfaction and increased employee morale. "On a project level, Partnering can reduce costs, schedules, paperwork, and litigation while improving construction quality. On a human level, it can ease stress, restore good will and enhance the simple satisfaction of going to work in the morning." Mr. Cowan claims Partnering produces, "a win-win situation for both sides in terms of time, dollars and morale."¹⁷⁴ Participants claim that Partnering has put pleasure back into the construction process for all parties. A Senior Counsel at the Portland District emphasizes with respect to the benefits that, "All this has been achieved without violating the objectives of the partnership."¹⁷⁵

¹⁷⁴Tarricone, p. 72.

¹⁷⁵Johnson, p. 9.

It is important to note that the benefits identified by public sector organizations on single-project applications are similar to the many benefits that the CII found in their investigation of the long-term Pure Partnering relationships in the private sector. The CII identified the overall benefits as, 1) improved ability to respond to changing business conditions; 2) improved quality and safety, less rework; 3) reduced cost, schedule and improved profit, innovation and constructability; 4) effective utilization of resources.¹⁷⁶

Although the private sector may realize a greater degree of benefits due to the repeat, long-term relationships, it appears that public sector organizations do realize long-term benefits through the application of lessons learned from experiences on multiple projects.

Finally it is imperative that these benefits associated with Partnering experiences are correlated with the adverse effects of the typical adversarial construction relationships described in Chapter 2. Without exception the benefits associated with Partnered projects are the direct opposite of the costs associated with the adversarial relationships involving other deliver processes. These beneficial trends reverse the negative impact of the traditional project. According to the Systems analysis these improvements can provide a positive motivational factor for implementing the process. Also they must be attributed to improvements in the Dispute Resolution System; the environment, relationships and procedure. The next section addresses how Partnering can achieve this.

¹⁷⁶CII, pp. 8-10.

5.2 Why Partnering Works.

The contrast between benefits identified in Partnered projects versus the problems attributed to the non-partnered, traditional delivery process is due to a reduction of the adversarial climate on construction projects. Partnered projects achieve better environments and relationships which enhance the use of more efficient dispute resolution procedures. The improved Dispute Resolution System is due to improved attitudes between the construction parties and the reduction of inequitable construction risks. Improved stakeholder attitudes exhibit the characteristics of the Win/Win paradigm and include open communication, trust, teamwork, cooperation rather than competition, a focus on common goals and synergy.

The Partnered projects have mitigated the unequal distribution of risks by the improved environment and individual relationships and through a fair execution of the construction contracts and efficient dispute resolution procedures. The project team focuses on preventing disputes rather than repairing damage caused by major, unresolved disagreements. Project delays are reduced due to low level decision authority, problem resolution models founded on Principled Negotiation and a strategy to maintain and achieve the shared objectives of the project team.

These findings are consistent with the trends the CII identified from a small number of public sector Partnered contracts in their study. CII stated the major benefits as, "establishing a close working relationship between owner and contractor; solving many supply and procurement problems; expediting the processing of claims and disputes

in a fairer manner; difficulties were resolved much easier than under traditional relationships."¹⁷⁷ The following sections expose the key attributes of Partnering that are responsible for the changes in attitude and risk allocation.

5.2.1 The Change in Attitude to Win/Win.

The positive shift in the attitude of stakeholders on Partnered projects is a significant change that improves the project's environment and organizational relationships. This paradigm shift does not happen easily. The discussion of causes of the adversarial construction relationships in Chapter 2 identified four key parameters affecting attitude, Win/Lose philosophy; different cultures of the stakeholders; competing goals between parties; and the litigious nature of our society in the U.S. The Partnering process addresses each of these parameters. The most significant elements of Partnering that effect these parameters are, the commitment of the top leadership of each organization; the impact of the Partnering workshops; and the stakeholder commitment to the common objectives in the Partnering agreements.

5.2.1.1 Commitment from Top Leadership.

The commitment of top organizational leadership is key to the success of any new or difficult endeavor. This commitment is essential for implementing the paradigm change from win/lose to win/win thinking

¹⁷⁷CII, p. 22.

in this industry. David P. Johnson, Senior Counsel for Contracting and Environmental Compliance at the Corps Portland District states, "There must be absolute commitment from the top leaders of participating organizations to the Partnering process. Employees tend to watch where leaders walk not how they talk. And problems will develop, Partnering is not a panacea. The minute any organization's leadership begins to balk at carrying out the tenets of the Partnership, the stampede to abandon ship will begin."¹⁷⁸

The Partnering successes of the three organizations studied in this thesis are attributable to this fact. The total commitment of the Corps top Commander, the Chief of Engineers, is represented by his ADR Policy Letter and overt support of Partnering. His actions have been responsible for encouraging its use by District Engineers and the growing knowledge of the process throughout the public sector. The Arizona DOT Director, Charles Cowan, has been the key to their initial success. He received the backing of the state governor and is a fanatic of the improved delivery process.

On the CAT the key leaders have endorsed the process. These include the leadership of MHD, the FHWA, B/PB, and the contractor for each work package. While the commitment of all of these leaders on the CAT is not at the same level as the Corps or ADOT, it is expected that this will improve as the project progresses. This will be key to their future success.

¹⁷⁸Johnson, David, P. "Partnering, Who Cares?" *Construction Business Review*, Sept/Oct 1991, p. 47.

The key leadership includes an organization's full time "Partnering Champion". This person bears the full time responsibility for the details of Partnering implementation. He/she acts as a coach to ensure that the process continues to progress and skills are developed by project personnel. They keep the idea alive when the project starts to get routine and "it reaches the doldrums"¹⁷⁹.

Who fills this role differs by organization though the responsibilities remain the same. MR Cowan states the champion is "a fanatic...that's the executives job."¹⁸⁰ On the typical project when Partnering is at the early stage the need exists for a high level advocate, normally a key manager from the organizations home office, an area manager or chief of construction. This is most effective because he can act as the coach for the whole team, facilitate problem solving within the organization and build the support of the home office staff. In the future, once Partnering is well established, accepted by the entire organization and experience has been gained at the project level, this may become the resident and project engineers. But, when Partnering is a new process being implemented the high level Champion is a critical resource for instituting and maintaining the Partnering process.

Lester Edelman, Chief Council for the Corps has stated,

¹⁷⁹Hartnett, Joseph, P. "What is Partnering" Speech given at the Constructive Resolution of Construction Disputes Conference, Washington, D.C. 7 Nov'91. p. 2.

¹⁸⁰Tarricone, p. 73.

"No organization can effectively implement a new way of thinking without the complete support of top management. Persistence by a champion at a high management level who truly believes and wants to share the vision of the value of ADR and Partnering within the organization is needed. The participation of a champion sends the important message of support throughout the organization. A Champion provides support to managers that must be innovative, willing to take risks, use judgement and make decisions in unfamiliar areas."¹⁸¹

The role of key leaders is critical to establishing, nurturing and maintaining the Partnering atmosphere. The leadership allows the members of an organization to make the win/win paradigm shift by encouraging the positive attitudes to grow and flourish.

5.2.1.2 The Effect of the Partnering Workshop.

The Partnering workshop is key to initiating the change in attitude between the project participants. The process allows stakeholders to quickly, gain an understanding of the win/win concept; individual and organizational differences in both personality and culture; develop complementary rather than opposing project goals; and realize issue resolution alternatives besides litigation exist.

The change in attitude by workshop participants was shown quantitatively in Chapter 4 from the surveys on the Oliver and CAT projects. Throughout MR Bonine's experiences introducing the Partnering concept he stated that the most critical comment he has heard after a Partnering Workshop is "It will be interesting", the most favorable is "You did it, You convinced a sceptic". He believes that a unanimous feeling is that the process cannot hurt a project.

¹⁸¹Edelman, p. 13.

"Everyone agrees it's better than not doing it. At least we have all met before we've begun work."¹⁸² At a minimum this avoids the worst case where the personnel, owner and constructor meet for the first time at the traditional ground breaking ceremony.

Comments from the CAT project workshop survey (included at Appendix A16-A19) show the initial benefits in attitude due to education in personality and culture. "The workshop got everyone working in the same direction. It allowed everyone to get to know each other in an informal manner; This provided the opportunity to meet the players involved on a somewhat equal level and that they are not faceless initials or signatures on the reams of paper that become inherent in a job of this magnitude; Laid groundwork for spirit of cooperation and openness, between owner/engineer and contractor contrary to the typical adversarial beginnings of many projects."¹⁸³

Comments by a Corps contractor on the Bonneville project were also favorable. "The workshop got the project off to an excellent start. The people started to develop a trust relationship and to know each other as individuals." Other positive results were "good attitudes developed on both sides of the project team, open meetings with the Corps with better access to the designers and technicians than normal, and a more open process to identify hard spots and to solve problems."¹⁸⁴

¹⁸²Bonine, interview 27 Aug '92.

¹⁸³CAT Work Package C07A1 initial workshop survey July 1992.

¹⁸⁴Geary, p. 740.

Positive results have also been experienced at Arizona DOT. MR Cowan encourages his Partnering teams to always incorporate a participant in a Partnering session if they ask to attend. A good example was the inclusion of the Native American Tribes and Park Service representatives on the Route 87 project. Partnering Manager Don Williams stated, "If you've invited more parties into the process than necessary, you will usually find that they are not in the way and have something important to contribute at some critical point."¹⁸⁵

The workshop is an effective forum for participants to share and align their goals. The case studies presented the shared goals that were developed for each project. An example of the alignment of goals is exhibited by melding the owner and contractor goals introduced in Chapter 2. The top owner goals were "1) Complete the project at the most economical cost; 2) Construct the project IAW specified quality; 3) Complete the project on schedule, and the top contractor goals were, 1) Make a profit on the contract; 2) Reduce liability exposure on the project; 3) Satisfy long-term business needs such as survival, growth, greater share of market, prestige, reputation etc."¹⁸⁶ Through the Partnering process these goals may be aligned into a new set of shared goals that are in both parties interests. For example: 1) Complete project within budget/estimate (reasonable profit for the contractor); 2) Construct quality product (source of pride and reduced

¹⁸⁵Arizona DOT, p. 4.

¹⁸⁶Dupes, p. 28, from: *The Business Roundtable, Contractual Arrangements*, Report A-7, A construction Industry Cost Effectiveness Project Report, New York, 1982, p.4.

liability for contractor); 3) On time delivery/on schedule; 4) Built right the first time/no rework; 5) No disputes or claims/no litigation. 6) Safe work site.¹⁸⁷ The aligned goals still meet the original individual aims of each party but both organizations share common criteria for the successfully completed project.

These aligned goals and common objectives replace the old individual, competing goals that adversely effect the attitudes of project personnel. The objectives are developed through mutual discovery, as a team, so all the players understand where they came from. During the workshop a facilitator assures that all the stakeholders participate equally in the process. This is necessary to ensure the objectives represent the entire teams goals. It also ensures the education process between organizations and gains the commitment of all the parties. "People tend to support decisions or solutions they have helped participate in resolving...Each partner must try to understand the position of the other partner to the agreement. This includes their culture, goals, and organizational constraints."¹⁸⁸

The workshop process is the catalyst that opens the communication channels between the parties involved. It also educates the participants on organizational cultures and develops mutual respect for individual roles within the project team. These characteristics are important to the development of the win/win attitude. The changed

¹⁸⁷Harnett, p. 4.

¹⁸⁸Johnson, "Partnering, Who Cares?", p. 48.

attitude mitigates the typical win/lose attitude associated with problem solving through litigation so typical of our society. Because of the open communication, problems are normally solved without ever escalating into a claim that could lead to a litigated solution.

The AGCA Manual identifies the benefits of the workshop and the Partnering process. "Partnering is an opportunity for public sector contracting, where the open competitive-bid process keeps the parties at arm's length prior to award, to achieve some of the benefits of closer personal contact which are possible in negotiated or design-build contracts."¹⁸⁹

5.2.1.3 Partnering Agreement/Mission Statement.

The commitment and motivation to maintain the positive attitudes, win/win philosophy and shared goals developed through the workshop is vital to the success of Partnering. The Partnering Agreement, Charter or Mission Statement is the symbol of the groups shared goals and a constant reminder to maintain the positive attitudes and team commitment.

Stephen Covey expresses the importance of the mission statement. It takes on the symbol of a constitution identifying individual or group goals and values. It becomes the criteria to measure the success or failures of the authors actions. Covey identifies that, to be effective for a group, the mission statement must be developed by its

¹⁸⁹AGCA, p. 3.

participants not just by the top executives. It is important that everyone has input to help insure commitment to a plan.

"Without involvement, there is no commitment...An organizational mission statement-one that truly reflects the deep shared vision and values of everyone within that organization-creates a great unity and tremendous commitment. It creates in people's hearts and minds a frame of reference, a set of criteria or guidelines, by which they will govern themselves. They don't need someone else directing, controlling, criticizing, or taking cheap shots. They have bought into the changeless core of what the organization is about."¹⁹⁰

On the Partnered projects the Partnering Agreements become important symbols. All the participants of the workshops sign the charter to symbolize their commitment throughout the life of the project. Copies of the charters are distributed. These charters are seen displayed in offices, reception areas and hallways in the buildings occupied by Partners of the Central Artery/Tunnel Project in Boston.

The AGCA identifies the importance of the mission statement not only as a symbol of commitment but as a key tool for the evaluation of the project progress. This was also identified in the cases studied that the evaluation surveys are developed from the elements of the Charter. This will be developed further in the discussion of the Partnering Maintenance plan.

¹⁹⁰Covey, p. 143.

5.2.2 Risk Reduction Through Partnering.

The improved attitude developed between project participants is a major step toward mitigating the adversarial construction relationships. Understanding the Win/Win concept cannot achieve a change in the paradigm alone. Practicing the concept requires a fair distribution of construction risks between the project teams. Chapter 2 identified the primary construction risks as individual safety and chance of financial loss. While safety is improved on Partnered projects and it is not a trivial issue financial loss is the focus of this analysis.

Chapter 2 identified the key factors that contribute to financial risk as, construction delays and changes; work with unknown parties; risk passing through contract documents; the resulting loss of project control; and the effects of a poor economy. The proceeding discussion describes how Partnering mitigates these factors.

Since the same contracts are used on Partnered projects as non-partnered projects it becomes clear that the major difference in risk is how the contracts are carried out. On Partnered projects the contracts are carried out in a fairer manner. The most important aspect is that problems are solved quickly, efficiently and fairly while ensuring that the project team goals are maintained. The problem resolution process must insure problems are not ignored, equitable solutions are achieved, project delays are minimized and unneeded financial expenditures are avoided.

The improved relationship developed between parties through the workshop process is important to developing and successfully executing

this problem resolution process. The fact that project participants have met and developed a relationship before the construction has started greatly reduces the risks associated with contracting with an unknown entity. The other risk factors are reduced due to, the ability of teams to focus on the project; the low level of project decision authority; the project issue resolution model; and the evaluation process that is critical to maintaining the Partnering process.

5.2.2.1 Project Focus.

The positive results of the Partnering workshop and the early development of favorable relationships between project players reduce the distractions of the project team. The open communications, trust and shared goals of the project team permit the members to focus their energies on the important aspects of the project. Stakeholders are not pessimistic, preoccupied with defensive actions to protect their own separate, individual interests. They can act optimistically, focusing on the project's team objectives. In their Partnering Manual the AGCA identifies that the process produces a "better quality product because energies are focused on the ultimate goal and not misdirected to adversarial concerns...It helps all of us in the construction process to redirect our energies and to focus on the real issues associated with achieving our ultimate objective."¹⁹¹

A recent editorial in *Engineer News Record* also identifies the improved focus on the project. "With everyone trying to shed potential

¹⁹¹ibid, p. 3 & 8.

liability, nothing gets done efficiently. Partnering asks companies and individuals to take some risk by taking off some of the armor. But also helps minimize risk by setting up a more cooperative atmosphere where the project takes top priority." Furthermore, this ability to focus energies leads directly to improved decisions and team actions. It is this, "process that allows for more efficient allocation of resources by minimizing their diversion to accidents, disputes, paperwork, and rework."¹⁹²

The reduced amount of paperwork, posturing letters between project stakeholders and the lower administrative costs identified in the project case studies is a direct result of this factor. The ability of Partnering to reduce or eliminate the many distractions typical on the non-partnered projects permit the project focus and increased efficiency of the construction team. This puts the stakeholders in better control of the project and reduces delays caused by wasted time.

5.2.2.2 Decision Responsibility.

The level of decision authority within each of the agencies involved in the case studies was associated with monetary values. The USACE resident engineers and district contracting officers maintain a \$50,000 and unlimited dollar authority. A recent change gave Arizona DOT resident engineers and district managers authority of \$50,000 and \$200,000 respectively. Employees at ADOT identified this new dollar

¹⁹²Schriener, 14 Oct '91, p. 64.

authority accounted for 95% of the decisions that were previously forwarded to the main office resulting in long delays. The CAT case severely limits the low level of decision authority on a monetary level. While the project director at MHD has attempted to change this through supporting the decisions of the low level managers it has become a recurring concern of Partnering teams during the CAT follow-up workshops. Typically contractor's project managers hold an unlimited decision authority for project decisions.

The trend of the Corps and Arizona DOT and the attempt by the MHD to put project control with project personnel and allow low level decision authority is an important aspect of shared risk. One of the most critical elements for the reduction of risks on the job is the way problems are solved. Key to problem solving in the Partnering process is ensuring that the right people are solving problems, solving them quickly and not allowing them to fester and grow. The decision authority is delegated to the individuals that know the project, it's problems and each other's organizational needs the best, the project manager for the contractor and the resident engineer for the owner. By public sector owners empowering their field engineers with decision authority they help to reduce the contractor risk because commitment to solutions is assured at the project level. The resident engineer does not have to check with a higher authority for all project changes. This in-turn reduces the delays associated with seeking higher level approvals, keeps the construction moving and avoids needless monetary losses.

This has been the Corps' intent. USACE has pushed as much decision authority as possible to the lowest level. The manager at field level, closest to the problems can settle disputes and make decisions on changes. This facilitates progress on projects through fast decision cycles.¹⁹³

The president of a contractor organization that has worked for the ADOT acknowledges this idea. "The key to the system is to delegate power to the project-level people. The higher-ups have to do that, and live with the consequences...When the resident engineer and the project manager strike a deal on a change order, the general contractor and the ADOT managers need to support that decision without second-guessing or nit-picking."¹⁹⁴

The AGCA Manual reinforces this notion of low level decision authority. They support the fact that this facilitates the problem solving process. "The Partnering process empowers the project personnel of all stakeholders with the freedom and authority to accept responsibility-to do their jobs by encouraging decision making and problem solving at the lowest possible level of authority."¹⁹⁵ The key is low level project control where fair decisions are made by informed parties, not hastily, but in a more efficient manner.

¹⁹³Rubino, F, Joseph, *Dispute Resolution in Construction*. Master's Thesis, Department of Civil Engineering, MIT, Sept 1989. p. 34.

¹⁹⁴Arizona DOT, p. 4.

¹⁹⁵AGCA, p. 3.

5.2.2.3 The Problem Resolution Model.

No matter how positive the relationship between parties, problems and disputes will develop on a construction project. If a fair and efficient problem resolution model exists, one that quickly addresses problems and reduces the decision cycle from the outset of the project, the financial risks due to changes, delays and disagreements will be substantially reduced.

The case studies presented the evolution of problem resolution models on Partnered projects. The initial model utilized on the Oliver project was effective but lacked a detailed plan for escalating issues to a higher authority. The TOCC project developed a more detailed escalation plan for solving problems between the Air Force and the Army. The CAT projects employ a more sophisticated issue resolution model and escalation process to force quick problem solving processes. Mr. Bonine identifies that "The Partnering payoff is in the problem solving technique."¹⁹⁶ This directly impacts the reduction of risk on a project.

The key elements of successful problem resolution models include, open communication; the characteristics of Principle or Integrative Negotiations as described by Covey or Fisher and Ury; addressing problems as they develop without delay; and involve an escalation plan that limits the time a management level can attempt to solve the problem before passing it on to a higher management level. The elements of open communications were clearly addressed in the

¹⁹⁶Bonine, interview 27 May '92.

discussion of changed attitude. Principled Negotiation Techniques are developed in initial workshops and were addressed in Chapter 3. The importance of immediate identification of problems and the escalation plan will be covered here. All of the organizations studied developed these elements.

Characteristics of the Corps resolution model are identified in a speech by Mr. John P. Elmore, USACE Chief of Operations, Construction and Readiness Division. He emphasizes the need to address problems quickly.

"The first and foremost method we use to reduce the majority of disputes is very simple. We attempt to resolve the problem immediately after it occurs, at the first appropriate management level, when the allegations set forth and the facts of the dispute can be compared, the impact of delay can be measured and the actual cost can be computed...If problems are ignored, avoided or suffer delayed resolution, they invariably become serious disagreements later, causing legal claims with inadequate documentation, exaggerated cost and additional expense for both parties, with attorneys becoming the controlling players."¹⁹⁷

The same philosophy is employed at the Arizona DOT. Members of the agency identify that due to the open communications, face to face relationships, and the Partnering environment there exists pressure to 'take care of business' and get problems solved and decisions made. Success on projects to date have shown that "ADOT District and operations people didn't let problems linger. It was in the spirit of our commitment to go ahead and resolve them (problems) quickly."¹⁹⁸

¹⁹⁷Elmore, p. 7.

¹⁹⁸Arizona DOT, p. 6.

The ADOT policy to maintain open access of contractors to designers identified in the Route 87 project also assists the process.

The importance of quickly identifying and addressing problems is an important concept. One conflict management firm identifies that "Negotiating a successful outcome once a dispute has arisen is often more difficult than negotiating agreement prior to the emergence of conflict. However, the difficulties are due more to the fact that by the time a dispute arises the parties are usually reacting emotionally and have dug in their heels on positions rather than on anything inherent in the substance of the situation."¹⁹⁹ Addressing issues quickly, as they arise, prevents the problem from developing into a major dispute and allowing parties to become entrenched in their positions over a long period.

The up-front commitment of stakeholders to acknowledge problems as they emerge is necessary. This ensures that parties will not ignore problems. If a problem is ignored initially it will normally not go away but grow into a much larger issue that will lead to a greater loss in time or money in the future. Up-front commitment and follow-on actions are key to reducing the risks of possible financial losses.

The next key element is how a problem that is not resolved at the lowest level is handled. The development of the escalation process introduced in the case studies addresses this. If the lower management level cannot resolve the problem through principled negotiations in a set period the issue is elevated to the next management level for

¹⁹⁹Gordon, Mark & Vargas, Frank. "Negotiations: How Do You Measure Success?" *Preparing for Construction in the 21st Century*. Proceedings of Construction Congress '91, ASCE, 1991, p. 781.

resolution. Both the Corps and the CAT escalation models include a disputes review board as the last resort. The goal is to not have the need to employ this ADR technique. It includes commitment by all parties to not take steps toward litigation or even formal ADR until the model has been fully employed.

The AGCA addresses the benefits of the escalation process, "Escalation saves time and money. It may prevent the stakeholders from taking a rigid position and thus keep a relatively minor issue from becoming a claim. Most importantly, it may preserve the working relationship of the key players."²⁰⁰

The process also puts added incentive for the lower management level to reach a fair, efficient agreement. Mr. Cowan identifies the human dimension of passing the issue to the boss. "Human inclination is to avoid going to your boss, or your bosses' boss, for help. That puts an imperative on solving problems at lower levels. The result is that problems don't languish and fester."²⁰¹ But management will not arrive at poor settlements because they know that they also must be able to substantiate their resolution to 'the boss' as well.

The escalation process is important to overcoming arguments that may involve personality conflicts or style differences between parties. The next management level also provides a different perspective of the problem and may include a broader 'big picture' view. A properly employed escalation plan clearly states that inaction

²⁰⁰AGCA, p. 6.

²⁰¹Cowan, p. 725.

is not an option. This ensures that timely decisions are made. Along with effective communications team cooperation is enhanced.

The Corps Bonneville Lock project provides some examples of the success of the problem resolution model. Two simple examples are presented here. The first involved contractor employee parking. The Bonneville project specifications identified that no contractor employee parking was allowed at the job site. One contractor had arranged for off site parking with a third party. During mobilization the contractor lost the off site parking location. As an alternative he wanted to create parking on part of the construction site not utilized. Due to the clear contract specifications the Corps initial management level denied the request. Escalation of the issue to the next management level identified that the parking restriction at the site was to avoid workers filling the adjacent fish hatchery and public visitor lots at the site. It was determined that there was no reason to deny the contractor permission to make his own on site parking area. The decision saved the contractor unnecessary hardship.²⁰²

Another example involves the interpretation of specifications identifying the required time for concrete, tunnel forms to remain in place for curing. The interpretations varied from ten days by the Corps resident engineer to two days by the contractor. The subcontractor had submitted his bid for the project based on his field experience and expectations of a fair administration of the contract.

²⁰²Kiewit, p. 35.

To meet the Corps' interpretation would have required a major expenditure to procure sufficient forms. Both sides escalated the problem. The parties communicated in a non-adversarial environment and reached a solution. They determined that the contractor should make this decision as long as the cure was maintained. A large additional cost and a weakening of the relationship was avoided.²⁰³

Questions exist on the Boston CAT project whether they can be as successful as the Corps. This is due to the vast size of the project, the decision level and extreme bureaucracy. Time will tell if the streamlined escalation process will work. The timeliness of decision approvals is the key to reducing owner and contractor risks.

It is important to point out that the escalation process does not mean that low level management should defer the resolution of problems to another level if they are empowered to make the decisions. It does require that parties take the responsibility to make proper decisions and that upper management provides them the opportunity to solve problems, and make decisions without the risk of penalty.²⁰⁴

The reduction of construction risks is a clear benefit of a proper problem resolution model. The AGCA states that the process results in "Expedited decision making with issue resolution strategies; Better time and cost control over project; and reduced exposure to litigation through communication and issue resolution

²⁰³Ibid, p. 29.

²⁰⁴Johnson, "Partnering, Who Cares?", p. 47.

strategies."²⁰⁵ The risks are also minimized because this process takes full advantage of the construction experts, not third parties, so project teams are in control, looking out for their own joint interests. The typical construction risks are significantly reduced.

5.2.2.4 The Maintenance Program.

The change in attitude and equitable sharing of risks must encompass the life of the construction project and full length of the parties' relationships. A successfully Partnered project must maintain the positive attributes and avoid returning to past adversarial characteristics. The Partnering maintenance plan is the key to avoiding such a slip. The project evaluation process is an important aid for assisting stakeholder to maintain control of the project and the Partnering atmosphere. The metaphor of the maintenance of a successful marriage exhibits this, "Partnering is very similar to a good marriage, it requires constant attention...periodic rejuvenation."²⁰⁶

The commitment at the beginning of the project to involve all stakeholders, set evaluation criteria and evaluation periods impacts the reduction of risks. Once again how the evaluation process is implemented determines how effectively the process reduces project risks. If the evaluation process identifies either the weakening of positive attitudes, inequitable sharing of risks or other unfair

²⁰⁵AGCA, p. 3.

²⁰⁶Johnson, "Partnering, Who Cares?", p. 48.

practices, the evaluation will be of no value unless actions are taken to address and solve these problems. Participants must again be committed to implementing the Partnering objectives.

The use of the team evaluations is another element that maintains open communications between stakeholders. The evaluations were important to identification of problems or deterioration of relationships on a number of the projects in the case studies. The poor completion rate of evaluations on the Oliver project and low survey scores on the TOCC and Bonneville Lock projects alerted Partners to problems. In all cases the commitment of parties to address survey results in constructive workshops got the project teams back on course and solved critical issues.

It is important that evaluations are conducted jointly by stakeholders and are not a one way evaluation by the owner. It becomes a teams cooperative effort to evaluate the job, based on the team goals and identified evaluation criteria. A weighted criteria can improve the objectiveness of the evaluation. The AGCA emphasizes that the process must include positive aspects and trends as well as shortcomings.

The evaluation process stimulated players at the project level on the Bonneville Lock to address issues face to face. They asked each other the questions "How are we doing? How can we improve?" on a more informal basis.²⁰⁷ It was also identified that upper management plays an important role in monitoring these evaluations and responding to

²⁰⁷Cowan, p. 725.

indicated problems. The evaluations along with periodic meetings of stakeholders with the champions and upper management facilitated the evaluation process. Players openly discuss project performance and any significant problems. This lead to smoother project performance.²⁰⁸

The maintenance program is key to meeting project Partnering objectives. The gains in the process are obtained over the life of the project and not through periodic implementation. Partnering produces a quality product through efficient utilization of resources. This efficiency allows stakeholders to optimize savings in both time and money. This helps to mitigate the risks associated with poor economic times where lump-sum projects are awarded to builders with low contingencies and small profit goals. The efficient Partnered projects allow for greater profits even during weak economic times.

5.3 Partnering Barriers.

The benefits associated with the Partnering process are not achieved automatically. It is difficult to capture the effort, skills and commitment required by stakeholders to make this concept successful. This portion of the analysis is to introduce critical barriers to the Partnering process experienced by the agencies studied. The barriers are similar to the problems that have slowed the acceptance of Alternative Dispute Resolution techniques as an alternative to litigation.

²⁰⁸Kiewit, p. 8.

Some key barriers would clearly be the failure of the elements that make Partnering work discussed in the last section. These barriers would include, weak commitment of stakeholder top leadership; ineffective project workshops failing to gain open communications and stakeholder commitment; poor development of shared project objectives; lack of project focus; no delegation of decision authority; ineffective problem resolution model; failure to follow-up and implement the Partnering plan. The discussion in the last section should be sufficient to understand these issues so they will not be readdressed here.

This section will address six more subtle barriers that were experienced on Partnered projects. These issues are, unrealistic expectations; institutional resistance; stakeholder cultural clash; stakeholder sophistication; personnel turbulence; and legal implications. A successful Partnered project must address these issues as well.

5.3.1 Unrealistic Expectations.

The danger exists for people, unfamiliar with the Partnering process, to enter into an agreement with extremely high expectations. They may be unaware of the intricacies of the process, the personal commitment required for success and obstacles that must be overcome to make the process work. Mr Cowan identifies that, "Partnering doesn't eliminate the problems of managing projects. It does create an environment and the processes to resolve those problems quickly to

everyone's advantage."²⁰⁹ Participants must understand this. They must have a sense of realism, problems will develop and the problem solving process requires effort and commitment. The level of commitment is no different for a small project or a large one. The need to communicate and solve problems requires the same dedication between stakeholders.

The process is also not meant to develop an overly generous relationship between participants, the concept of the 'good ole boy' attitude.²¹⁰ This would develop into a lose/win proposition. Partnering is meant to open communications and have participants see the benefits of working together rather than separately. Stakeholders cannot expect Partners to compromise integrity or yield unreasonable concessions. They must appreciate each others responsibilities and positions. This includes the limits of public sector laws.

It is important that stakeholders understand that Partnering is not a 'fix all'. If this is not understood expectations may become too great and lead to frustrations. Partnering, like the analogy with marriage, takes a lot of constant effort to make it successful. One of the contractors that the Corps has worked with developed a motto that represents the process well, "Work at Partnering and Partnering will work".²¹¹ The key to avoiding the obstacle associated with unrealistic expectations is education and gaining a clear understanding of the Partnering process.

²⁰⁹Cowan, p. 725.

²¹⁰Dupes, p. 35.

²¹¹The project motto of Kiewit Pacific Co.

5.3.2 Institutional Resistance.

Partnering requires the commitment of all participants within a single stakeholder's organization. One of the greatest obstacles to success can be the failure to convince parties within an organization to make the shift from the old to the new way of conducting business. The Corps experienced such a problem in the implementation of ADR techniques and Partnering. Because not all organization employees can participate in the Project Partnering workshop they must be educated on the concept.

Many of the institutional barriers the Corps experienced relate to resistance to change. These include, fear of the unknown; wariness of new roles; turf protection; organizational inertia; and even ego or professional vanity.²¹² This must be overcome or at least reduced through education in Partnering concept and professional leadership.

These characteristics were apparent by some participants in the Corps' Oliver project. Project interviews from Partnering sessions addressed these issues. The problem appeared to be more prevalent at the home office staffs than on the project site itself. Comments by contractor personnel reflected this. "There may be some restrictions and lack of support from the Corps' home office,.. it seems people at the home office are not willing to change. Also there is a problem at the inspector level-derogatory comments. Inspectors still have a hard line attitude. At lower levels people can tell you the concept of

²¹²Lancaster, Charles, L. "ADR Round Table." *Alternative Dispute Resolution Series: Working Paper #1*. USACE Institute for Water Resources, March 1990. p. 2.

Partnering but don't practice it...They need to be open to change. We keep hearing, 'it's always been done this way'.²¹³

Another impact of the organizational resistance is that managers that would like to apply a new concept are reluctant to do so for fear of criticism. The Corps felt this from both within their organization and from outside agencies that were responsible to overwatch operations such as the Inspector General. New concepts can often appear to 'rock the boat' and obtain unfavorable reactions from 'whistle blowers' who don't really understand the process or feel that the negotiated settlement was not in the best interests of the government.²¹⁴

Internal resistance to the Corps' use of negotiated settlements under ADR practices was sometimes strong. Mr Edelman attributed some of this to "...the intense feeling of personal investment in a position by middle management and the technical staff. Anything short of a complete validation of the original position may seem to be a challenge to their professional skills or integrity...There may also be a feeling that the negotiators have failed to support the line managers and technical staff, and that the staff has been overruled."²¹⁵

One other impact of the institutional resistance is failing to comply with the escalation process. "The escalation concept may be

²¹³Dupes, p. 825.

²¹⁴Edelman, p. 7.

²¹⁵Ibid, p. 8.

great in theory but difficult in practice. It's human nature to avoid running to the boss when there's a problem. Managers on both sides may be hesitant about escalating a minor conflict, but when disputes sit and fester, the Partnering agreement is undermined.²¹⁶ "From both sides there is a reluctance to escalate-top management isn't close enough to know when that escalation is needed and there is a natural but unproductive reluctance to escalate on both sides."²¹⁷ Support of the process by the Champion and at all levels of an organization is needed to overcome this deficiency.

Implementation of a new concept such as Partnering will meet institutional resistance. The Corps has found that the most effective way to overcome these barriers is through the commitment of top leadership and a positive education process to ensure employees understand the process and its benefits.

5.3.3 Stakeholder Culture Clash.

Just as institutional resistance is a barrier within a single stakeholder organization cultural clashes can be a barrier between Partnering organizations. While the workshop is intended to educate participants on the differences between organizations, time is required for individuals to fully implement the new mode of operation. The cultural clashes can be caused by lack of commitment to the process, lack of understanding, or the momentum caused by years of

²¹⁶Tarricone, p. 74.

²¹⁷Geary, p. 743.

operating in a different, win/lose manner. Overcoming these problems takes time, requires developing motivation and skills to implement the process and open communications so the problems are addressed rather than ignored.

As discussed in other sections commitment of stakeholders is key. Participants must share equal commitment and not treat the process with occasional approval. "By nature of the term it takes two to Partner, and reluctant warriors on either the owner or contractor side will doom the process from the start. The AGCA manual warns against giving lip service to the term, pointing out that treating the concept as a fad is not true commitment."²¹⁸

If participants understand the benefits of the process commitment will be more automatic. This commitment must be translated into open communications so the hard spots can be addressed in a non-adversarial manner. Implementation of Partnering on the Bonneville Lock project experienced many of these problems by both the contractor and owner teams. It was found that when the issues were addressed in a open manner the participants were able to overcome the difficulties and maintain the proper atmosphere.

Some of the contractor's cultural problems included regularly blaming others for problems, reluctance to share information with the owner and the appearance that production took priority over quality. The owner's weaknesses were, a rigid, black and white view of the

²¹⁸Tarricone, p. 74.

specifications and quality; a desire to control both methods and results; an unwillingness to share risk; and a desire for power.²¹⁹

Comments by a Corps contractor on the project identify that these were issues after 12 months into the project. The contractor still blames everybody for problems there is "...a tendency to try to get by with aggressiveness and pushing to hard rather than to communicate; an unwillingness to share knowledge and plans with the owner." He stated that the owner 'black and white view' of issues shows an "unwillingness to share risks, a desire for power, or wanting to have a hammer...The decision process seems to be considered privileged information."²²⁰ One example was the designers apparent belief that the contractor should not be using the specified tolerances-they felt that the contractor should be trying for perfect alignment and perfect finish.²²¹ The contractor states that the owner sometimes does not realize that a failure to share risks during the project can lead to sharing them in the long run anyway, through claims or lawsuits.²²²

While the owner-contractor relationships on the Bonneville Lock project have not always maintained a peak level, because of the commitment to the project goals and the open communications the project team has worked through the difficult times and continue with

²¹⁹Ibid, p. 74.

²²⁰Geary, p. 742.

²²¹Kiewit, p. 38.

²²²Geary, p. 742.

a successful project.²²³ The evaluation process as well as follow-up workshops were important to rehabilitating weakening relationships.

Part of overcoming the paradigm change is the importance for stakeholders to understand "...Partners cannot control every aspect of the Partnering operation. They must give up some control in order to let the Partners exercise their expertise and perform more efficiently."²²⁴

5.3.4 Stakeholder Sophistication.

Sophistication of stakeholder organizations was not a major issue in the project case studies but has come up in discussions. This issue is whether Partnering will work on projects where the owner does not have significant experience in the construction industry or the contractor may lack advanced contracting skills. The lack of experience in this area can only lead to suppositions. It would appear that this could impede clear communications and the development of shared goals between project teams. Due to the lack of experience or knowledge of either stakeholder the development of trust may not reach the same levels experienced on the successful projects. But once again it is hard to see where the effort to enhance understanding and communications could become a disadvantage to the project.

The Mobile District's selection of an initial test project for Partnering on the Oliver project took contractor sophistication into

²²³Kiewit, p. 37.

²²⁴Ashley, p. 6.

account. The Corps, "...felt it was important to have a large, sophisticated contractor. One who had adequate financial backing and who had the capabilities of learning an advanced contracting approach. This seems common among owners."²²⁵ The ability of the organizations to pass responsibility down to lower management levels may also effect this decision.

Mr Cowan dismisses this idea. He stated that "If a private sector company spends a large amount of its resources on the construction of facilities, it will be interested in Partnering."²²⁶

The other issue of sophistication is the ability of the owner or the contractor, that may have had poor experiences working together in the past, to put those issues behind them and start their relationship anew. The contractor on the Oliver project identified that the Corps may not have accomplished this in their relationship with some subcontractors. The Corps identified subcontractors that they had problems with previously. The contractor felt that "The Corps' negative attitude toward some past jobs has hurt this job with Fru-con. One of the inspectors is really coming down hard on our blasting subcontractor...Previous battles with subcontractors have carried over to this job".²²⁷

Stakeholders must be aware of these issues of sophistication. To ensure these issues do not become barriers to the process parties must

²²⁵Dupes, p. 56.

²²⁶Tarricone, p. 74.

²²⁷Dupes, p. 828.

gain a firm understanding of the process and develop trust so they can address their concerns in an open atmosphere where the issues can be solved by the project team.

5.3.5 Personnel Turbulence.

There are two issues associated with personnel changes within a Partnered project. New project personnel must be educated on the Partnering concept and adequate personnel resources must be maintained so the problem solving process is not undermanned. Experiences on both the Oliver and Bonneville projects identified the importance of these issues. Personnel changes must be planned for on Partnered projects. Failure to do this will significantly reduce the team commitment and hurt the communication process.

The project manager from the Oliver project identified that the biggest problem that he experienced was the vast change in personnel over the four year project life. The contractor had changed all but one of the original key workshop personnel by the job completion and the Corps had changed the District Engineer twice. He believed changes in personnel must be planned for and that additional workshops are necessary to gain the commitment and trust of the new team.²²⁸

The prime contractor on the Bonneville project stated "It is very important to get late arrivals up to speed very quickly in Partnering." A major subcontractor who came onto the project after the initial workshop had significant problems with changes to his work.

²²⁸Birindelli, Interview 1 Sept '92.

Once an effort was made to educate the subcontractor and his people in the Partnering process the problems were handled much easier. A new resident engineer on the project was also brought on board late. He spent time learning the process from the project manager and participating in joint evaluation sessions and discussion.²²⁹ The Central Artery/Tunnel project has conducted one day sessions to get the new arrivals educated in the Partnering process.

The changes in personnel must also account for providing ample resources to address issues on the projects. The problem solving aspects of Partnering require people to address the problems and develop positions to resolve the issues. This was addressed on the Bonneville project by the prime contractor. "It takes engineering and planning by knowledgeable people to develop these positions quickly so that the Partnering process can reach an informed compromise. So, we have made a commitment to man this project with adequate people resources to stay on top of problems."²³⁰

Education of newly arriving project personnel and adequate personnel manning are two important personnel issue that must be recognized to develop a positive Partnering process.

5.3.6 Legal Implications.

Two important legal issues that may represent barriers to the success of a Partnered project are unrealistic expectations that some

²²⁹Geary, p. 740.

²³⁰Ibid, p. 742.

legal requirements can be circumvented and an unintended commitment to a legal arrangement. "A constructive working relationship with the private sector does not mean that the vigilance necessary to protect the public interest is lessened in any way."²³¹ All public sector agencies have strict regulations for the procurement of construction or contracting services. While none of these regulations prohibit cooperation between contract participants procedural regulations cannot be disregarded.

The reduction of paperwork has been a major goal of personnel on Partnered projects. This must be accomplished carefully. The Bonneville contractor addresses this issue with respect to notification requirements. "We must be careful not to cut out too much paper. There is a danger of not adequately informing all players without basic notice letters stating problems of time or cost early. Also we can't neglect required notice provisions in the contract or under the law. However it is not necessary to be confrontational or argumentative in letters. Give a simple notice, then get together and communicate on the problems quickly and the paper work will be greatly reduced."²³² This type of action meets the letter of the law and reduces unnecessary paperwork concurrently.

There are also times when Partnering cannot resolve a major problem. If at some point a major mistake has been made by a Partner or the law has been broken, Partnering cannot absorb the error.

²³¹Johnson, p. 8.

²³²Geary, p. 741.

Examples can be failure of a design to meet code or an accident attributable to improper design or construction methods. The appropriate party must accept responsibility for the error or the legal system must address the resolution of these types of problems.

Finally Partners must be aware of the legal consequences of working relationships. While the Partnering process in the public sector typically identifies that it is not a contractual arrangement participants should still understand that contracts or actions can categorize a business relationship and implicate legal requirements. This has not been an issue on the majority of public sector Partnerships.

Participants should clearly understand the legal definitions that are used to categorize the typical legal relationships practiced in the construction industry. These most frequently include, Partnership- "an association of two or more persons to carry on as co-owners of a business for profit."; Joint Venture- "an association of two or more persons who undertake a single business enterprise for profit for which purpose they combine their property, money, effects, skill and knowledge."; Principle and Agent- "a relationship is established when one person or corporation manifests an intention that another shall act in its behalf and subject to its control."; Independent Contractor- "One who performs services for a specific person or entity but retains control over the manner and method in which those services will be performed."²³³

²³³C11, pp. 36-37.

Each of these relationships correspond with varying duties and responsibilities under the law and do not relate to the relationships intended by the public sector Partnering process. The key is that participants do not create ambiguous positions that may develop one of these relationships. The major implications that could arise include tax requirements, indemnification or liability issues. While a detailed discussion of this issue is beyond the purpose of this text the key issue is education of the problem. "To avoid future complications it is key to pay close attention to the contracting phase as well as the rest of the Partnering process."²³⁴

5.4 Analysis Summary.

This analysis of public sector Partnering has included three key elements, the identification of beneficial trends on Partnered projects; why the process can produce these benefits; and important barriers to the Partnering process. The benefits associated with the process correspond directly to costs associated with the traditional adversarial processes. The identified Partnering benefits include improvements in delivery time, project costs, value engineering savings, worker safety, reduction of bureaucracy and no litigation.

Partnering works because the process addresses the key elements of the Dispute Resolution System. Elements of the Partnering process mitigate the causes of the adversarial construction climate. Partnering improves attitudes by addressing environmental and

²³⁴Ibid.

relationship issues. It reduces inequitable risk sharing due to the improved attitudes and through implementation of effective dispute resolution procedures. These issues are summarized in Figure 5-1.

ATTITUDE, ENVIRONMENTAL AND RELATIONSHIP ISSUES	
Traditional Problems	Mitigating Elements
Win/Lose Attitudes	Win/Win Philosophy
Litigiousness of Society	Top Leader Commitment
Stakeholder Cultural Differences	Workshop Skill Development
Competing Stakeholder Goals	Partnering Charter/Shared Goals
FINANCIAL RISKS AND PROCEDURAL ISSUES	
Traditional Problems	Mitigating Elements
Risk of Delays and Changes	Fair Contract Execution
Business Between Strangers	Project Focus
Contract Documents	Low Level Decision Authority
Economic Effects	Dispute Resolution Model
	Evaluation and Maintenance Plan

Figure 5-1. Partnering System Analysis.

Partnering project teams also face barriers to success. Besides ensuring the elements of what makes Partnering work are maintained

Partners must be prepared to overcome unrealistic expectations, institutional resistance, stakeholder cultural clashes, lack of sophistication, project personnel turbulence and legal implications.

To ensure the success of the elements credited with mitigating the traditional adversarial problems and to overcome barriers to the process requires ample motivation, individual and team skills and sufficient resources. The projects investigated had sufficient levels of these elements to develop the benefits identified. The motivation came from the identified benefits and desire to overcome past costs. Positive leadership that supports the process and enforces its implementation is also a key motivator.

Skills were introduced at leadership schools and at Partnering workshops. Throughout the case studies teams tended to revert to old, bad habits if sessions were not held to enhance and maintain the basic skills associated with the new paradigm. Education is a critical element needed to overcome the barriers discussed in this chapter.

The resources required to implement Partnering include shared financial expenditures for workshops. More important are the resources to enhance stakeholder skill development. These include leadership, the efforts of the Partnering Champion, manuals or books and the time with a professional facilitator. Resources that can be maintained at the project are key. In the future intelligent or expert systems²³⁵ that can query and assist stakeholders in resolving disputes may be an important resource.

²³⁵Professor Lawrence Susskind at MIT identified that these systems have been designed and may be an important element for this system.

THE FUTURE OF PARTNERING

The positive trends resulting from the Single-Project Partnering process within the public sector construction industry distinguish it as an important concept with great promise for the future. Two questions that remain are; How Can the Process Be Improved? and What is the Future of Partnering? The purpose of this chapter is to addresses these two, final questions and provide some concluding comments on the subject.

6.1 Alternatives for Improvement.

While the benefits of the Partnering process have been documented over its four year application in the public sector, there is no reason to believe it represents the ultimate project delivery process. There are always ways to improve any new or existing management technique. The last chapter identified the importance of developing more responsive resources to be used to improve the skills of stakeholders applying the concept. The purpose of this section is to present five concepts that could complement the Partnering process and can be applied in the public sector construction arena. The five concepts are, Improved Risk Sharing Through Contracts; Incentive Programs; The Rolling Partnership; Project Goal Focus Sessions and employing Partnering with Design/Build Contracts.

8.1.1 Improved Risk Sharing Through Contracts.

The discussion of Why Partnering Works in Chapter 5 identified that the public sector construction contracts for the Partnered projects did not differ from contracts on non-partnered projects. The key to the project improvements were changes in attitudes and sharing of risks through fairer execution of contracts. The CII discussion of contracts in the Pure Partnering relationships stated, "From the purest standpoint, the contract is not an important part of the Partnering process...The key is...that the contract promotes Partnering and complements the philosophy of the concept rather than contributes to an adversarial relationship."²³⁶ This idea applies to the public sector as well. Risks could be shared in a more equitable manner while still protecting the interests of the taxpayers and further improving the relationships of project stakeholders.

The discussion in Chapter 2 identified three important aspects of construction contracts as the award method, contract type and contract language. Within the public sector varying degrees of progress could be or has been made in each of these areas. Applying these changes to contracts on Partnered projects would equalize the risk of stakeholders, complement the Partnering process and mitigate more of the adversarial primers in construction.

The issue with most promise for improvement is the contract award method. Many public sector agencies have made great advancements in this area in recent years. Rather than employing the lump-sum bid, the

²³⁶CII, p. 36.

use of multi-parameter bidding and negotiated contracts has increased. Both of these concepts are more acceptable to contractors and if conducted properly can result in enhanced product quality for owners. These processes can improve the relationship between stakeholders.

The U.S. Army Corps of Engineers has recently received greater flexibility in employing their multi-step contract award processes. The two-step process (DFAR 214.503) involves separate technical and bid proposals while the four step process (DFAR 215.613) involves separate technical and bid proposals and evaluations, setting a competitive bid range, negotiations and submission of final proposals.²³⁷ The J-6 Rocket Test Facility involved a multi-parameter bid process. The U.S Postal Service, Bureau of Reclamation and Florida State Highway Department have employed negotiated award contracts.²³⁸

The second possibility is employing a less adversarial contract type. Rather than the extremes of the fixed price or reimbursable contracts financial risk may be best shared with the use of Guaranteed Maximum Price contracts. There are occasions when reimbursable contracts have been used, primarily on extremely complex, highly technical projects like nuclear facilities or in the case of emergencies after a natural disaster. A study in 1988 showed reimbursable contracts can be beneficial. On a "carefully controlled private sector project, cost reimbursable work cost 10 percent less

²³⁷Elmore, p. 3.

²³⁸Nicholson, p. 68.

than was paid under a lump sum contract to another builder for identical work.²³⁹

While the public sector tendency is not to employ these types of contracts the Corps is authorized to use cost reimbursable contracts (DFAR 16.404-1 & 2) and unit price contracts (DFAR 16.2, 12.403c). Unit price contracts are used primarily on heavy construction or dredging operations when material quantities are unknown.²⁴⁰

The third issue is to mitigate risk shifting contract language. This appears the most difficult to change and may be the most unrealistic option. This would entail a review of public sector contracts to identify and reduce the adversarial clauses that are not needed once the Partnering process has become well understood and becomes common practice. In most cases the changes would require legislative approvals which could take long periods of time. Approvals would require officials to be educated and confident in the Partnering process. It could also lead to government officials requiring Partnering to be conducted. However, the Partnering process can not be mandated to work.

These risk reduction options would complement the Partnering process through their more equitable sharing of construction risks between stakeholders. The implementation of any of them would send another message to the private sector constructors identifying the

²³⁹McGinnis, p. 592.

²⁴⁰Simoneau, p. 62.

public sector's commitment to reducing the adversarial construction relationships.

6.1.2 Incentive Programs.

Construction contracts have typically employed negative incentives to force contractors to meet owner requirements. A typical example is the contractor penalty payment for a late delivery. However, research conducted by the CII identifies that "positive incentives are more effective in modifying contractor behavior than are negative ones."²⁴¹ "Incentive fees that can be increased when the owner perceives achievement spur contractors to greater excellence and most often result in a warm and productive relationship. Contracting costs and administration expenses are minimized."²⁴² Positive incentives more effectively align owner and contractor goals, improve the team relationship and could significantly complement the Partnering process.

The use of positive incentives is much more prevalent in the private rather than the public sector. The Fluor-Daniel/Dupont Partnership has employed incentive fees in their contracts. Team evaluations identify the amount of fee to award to the contractor and the program has been very successful. Public sector regulations are typically very restrictive in allowing these types of procedures.

²⁴¹McGinnis, p. 592.

²⁴²Edminster, p. 53.

The Corps has been effective in using incentive fees on some selected projects. The restrictive process is governed by the FAR (FAR 16.404-1,2) under cost reimbursement with either award, incentive or fixed fees.²⁴³ The J-6 Rocket Test Facility project presented in Chapter 4 was one example and it has had very favorable results. Incentive fees have also been used on another Partnered project, the \$47.8 million USAF Solid Motor Assembly Building (SMAB) at Cape Canaveral, Florida completed in 1991. On the SMAB project a review board evaluated the project at predetermined periods and identified the percent of the incentive fee to award to the contractor. The project was completed in a record time of 18 months.

When incentive fees are used it is often the owner who makes the unilateral decision of how to employ the reward system. More often in the private sector the incentive programs are negotiated between parties. The Partnering process would allow for an optimum atmosphere for developing an incentive program as a team to maximize its effectiveness. The program could develop the type of incentives as well. Monetary incentives can take the form of adjusted fees, cash awards, shared savings. Non-monetary awards such as individual recognition, awards, lunches, dinners, and small tokens (hats, mugs, jackets, etc) can improve employee moral. While incentives must be managed to meet public sector regulations they can be offered.

The CII has identified the great benefits that positive incentives can produce. "When incentives are used in a Partnering

²⁴³Simoneau, p. 62.

setting, they serve to reinforce the behavior expectations of the parties, focusing attention not only on the traditional measures of costs and schedule, but also on quality improvement, innovation and interface enhancement."²⁴⁴ They are an important tool that if employed could significantly enhance the Partnering process.

6.1.3 The Rolling Partnership.

The notion of a Rolling Partnership is conceptual.²⁴⁵ The process would involve Partnering all phases of the life cycle of a construction project; conception, development, design, construction, operation and maintenance. The aim would be to start the project under a non-adversarial atmosphere and maintain the atmosphere by integrating new team members as they were awarded contracts for the different phases of the project.

The new team members would be integrated in a manner similar to the new personnel integration sessions conducted on the Oliver, Bonneville and CAT projects. The integration sessions would actually be conducted as full scale Partnering workshops. An example would be a Partnering session held between a public sector agency and officials required to approve or participate in the project. Next other public agencies, even citizen groups would become team members as the concept is developed. Once commitment was made to hire a design agent that organization would become a team member. This process would continue

²⁴⁴CII, p. 39.

²⁴⁵LTG Hatch referred to the concept by this name at the MIT Symposium on Construction in the Northeast, 12 May 1992.

for the selected contractor and may include a maintenance program for the completed project.

The benefits of this process would come from the closely integrated project team, communicating in a positive environment. The process could result in a better project due to public involvement, understanding and acceptance. Clearer communication of the owners intent and needs to the designer would result in improved specifications and construction documents. The integration of the constructor would be facilitated due to the team atmosphere already existing between the owner and designer and should facilitate the communication of project intent to the contractor as well as constructibility issues from the builder's perspective.

While the Corps is just beginning to Partner design contracts the Arizona DOT has had positive experiences with design Partnerships. This concept would extend this experience and take greater advantage of the Partnering Process. It could be initiated within the public sector and would not require changes to current laws or regulations. This Rolling or Phased Partnering process could approach some benefits of Design/Build contracts without the legal requirements.

6.1.4 Project Goal Focus Sessions.

Project Goal Focus Sessions would involve working sessions between project partners to brainstorm strategies to reach project goals. These sessions would supplement the efforts of the initial Partnering workshop and involve the appropriate personnel from the stakeholder teams that could address specific project team goals.

These sessions would be similar to the week-long workshop the members of the Bonneville Lock Project held to focus on ways the project team could improve the initial project schedule and meet value engineering goals.

However, this idea would involve an up-front plan to conduct focus sessions upon completion of the initial workshop. It would not require all the same participants of the initial workshop but the key personnel that could effect the process. Each of the project goals included on the Partnering Agreement could be the subject of an individual focus session. Examples would be budget sessions where representatives of the designer, owner and builder would conduct detailed analysis of where savings could be made. The same efforts could be applied to value engineering, schedule, safety, quality or ways to streamline the bureaucratic processes.

While the administrative time to conduct these focus sessions may be an issue, conducting sessions for the priority goals may be a better option under some circumstances. This effort would help approximate some of the advantages of the design/build method but on a traditional delivery process. These team focus sessions would take greater advantage of the Partnering process and should result in greater benefits and enhance project relationships.

6.1.5 Partnering with Design/Build Contracts.

The CII Partnering Task Force identified early team involvement in design as a key benefit of the private sector, Pure Partnering process. It "Helps avoid redesign problems, assures design will be

buildable and affordable early in the process, decreases project duration, produces more active engineering efforts."²⁴⁶ To obtain this benefit in the public sector would require the immediate involvement of the designer and contractor, the use of Design/Build contracts. The integration of Partnering with Design/Build contracts in the public sector would be the closest approximation of Pure Partnering in the private sector. This would obtain the greatest benefits in overcoming the adversarial construction relationships and maximize the advantages of project team communications.

The Design/Build method of delivery was developed in the private sector by integrating the three phase, traditional, design-bid-build process into a single contract. The owner hires a single project team to conduct both the architectural and construction services. The advantages of the process includes a much quicker, streamlined delivery due to a synergistic team effort. The unified project team communicates more efficiently resulting in increased innovation, constructability analysis by the builder and value engineering by the project team.

There are some disadvantages to the process that primarily concern the owner's interests. The owner can be isolated from the project due to the Design/Build team arrangement. The owner loses some of the checks, balances and control typically associated with the intermediary position between the designer and builder on traditional projects. He is not required to coordinate actions between the design

²⁴⁶Ibid, p. 17.

and construction phase. The architect is not the owner's ally or representative as in the traditional process since he belongs to the design/build team. Due to the owners diminished involvement in the project he may not be aware of issues that develop that may impact project cost, quality or delivery time. The project design is normally not completed until after construction has started. A clear picture of project costs, schedule and compliance with the owner's expectations are not realized until late in the project.

Public sector organization avoided this process for years due to these disadvantages, regulations, legislation, and the concern that it was not in the best public interests. Agencies felt that the process increased public risks, posed the possibility of unethical practices, provided an unclear picture of the final product, and involved difficulties in implementing a subjective selection process. Recently many states have overcome these issues through improved owner specifications and selection processes involving pre-qualification, multi-parameter bidding and proposal systems. Massachusetts has successfully employed the Design/Build process under special conditions. The U.S. Army Corps of Engineers, after experimenting on several congressionally approved projects, has obtained new guidelines that have increased their ability to employ this process in their one and two step processes.²⁴⁷

The application of Partnering along with the Design/Build process could reduce the risks associated with the project to a greater

²⁴⁷Simoneau, p. 78. This thesis provides a detailed analysis of the Corps of Engineers alternative project delivery methods.

degree. Partnering would assist in building a complete project team reintegrating the owner as an involved participant. Through the development of clear communications the owner would gain insight into the Design/Build team's concerns and methods and improve his trust and confidence in the quality the team would deliver. The owner may also communicate his expectations of the final product more clearly. This could enhance the performance of the designer and constructor through a better understanding of the owners goals. With these improvements to the Design/Build process the other advantages of this innovative delivery process could be realized in a more efficient, all gain environment.

An article written by Mr. Joseph Nicholson reference the Design/Build process identified the owner's responsibility in providing accurate information for the design and the contractor's responsibility for the design and installation of the project. He stated,

"Risk sharing will come about when owners and contractors finally realize they should act as a team with quality in construction as their goal. The team approach will lead to lower prices for the owner because the contractor will place fewer contingency costs in his bid. It will also lead to innovation, since the contractor is rewarded for economies of design as well as installation."²⁴⁸

Integrating the Partnering process with this thinking will result in the optimization of the construction process and the greatest benefits for all participants in the public sector construction industry.

²⁴⁸Nicholson, p. 68.

6.2 The Future Role of Partnering.

The Partnering process will continue to gain acceptance and play an important role in the future of the construction industry due to its identified effectiveness. Six areas in which Partnering could play an important future role are in, lowering construction industry costs; increasing innovation in construction; providing a new role for the construction manager; the rehabilitation of the Nation's infrastructure; environmental remediation projects; and in providing lessons for private sector applications. These six roles are introduced in this section.

6.2.1 Lowering Construction Industry Costs.

As the application of Single-Project Partnering increases in coming years the long-term effect could result in significant cost savings for the construction industry. Based on Corps and Arizona DOT experiences savings could range from 3-5%. The savings should result from both direct and indirect effects. These characteristics were discussed for individual projects in Chapter 5.

The cost savings associated with the direct impacts of Partnering would include value engineering savings, constructability benefits, schedule maintenance and lower project costs due to more efficient bids resulting from reduction of the contingency or 'hassle fees'. Indirect cost savings are difficult to predict, but would be attributed to reduction or elimination of litigation and other associated costs. This could include lower premiums for liability insurance which could decline due to fewer claims and court

requirements. Sureties may also be able to reduce their charges for Bonds on Partnered contracts due to the reduced risks that the contractor assumes on these more equitable projects. Some of these benefits have been seen on individual projects. These trends should continue and will add up over long-term applications of Partnering.

6.2.2 Increased Innovation in Construction.

Critics of the traditional delivery system have identified its effect on limiting innovation in construction. Nicholson says of the "...rigid competitive bid contracting system. The antiquated process chokes off innovation at every turn."²⁴⁹ Innovation is stifled when a party is forced to accept substantial risk with no opportunity for reward.²⁵⁰ Innovation has been seen at the project level on all the Partnering case studies, a result of the brainstorming and problem resolution models between project team members. As the use of Partnering increases another long-term effect will be improved innovation as project team synergy creates new solutions to tough problems.

An ASCE paper quoted J.A. Murillo who felt the key to increased innovation is, "...closer relationships between the design function and the construction function appear to be a better formula for innovation than the separation typically practiced in the United

²⁴⁹Ibid, p. 66.

²⁵⁰Ahmad, Irtishad. "Restructuring Responsibility and Reward for More Construction Innovation." *Preparing for Construction in the 21st Century*. Proceedings of Construction Congress '91, ASCE, 1991, p. 454.

States...the owner, designer and contractor must each be free to innovate and to work together toward achieving one objective rather than adopting adversarial roles that have made the most successful projects a lawsuit paradise.²⁵¹ The Partnering process helps achieve this, and is most effective when combined with the Design/Build process. The processes closer working relationships, open communications, aligned goals, problem solving techniques and brainstorming between disciplines is reflected in the value engineering and constructability savings experienced on Corps and Arizona DOT projects. This is a direct reflection of the ability to innovate on the Partnered project. These benefits will increase over time. As Partnering expands so will the synergy and sharing of ideas associated with innovation.

6.2.3 New Role for the Construction Manager.

It appears that a new role for the Construction Manager is emerging along with the Partnering process. In the past, Construction Managers (CM) have been utilized in both the public and private sectors. Their role has varied significantly from project to project. The CM can be employed to act on the owner's behalf and provide full services including project conception, design, construction, and completion, actually managing all aspects of the project. The CM can also play a limited role as a consultant to the owner for a single phase of the project.

²⁵¹J.A. Murillo as quoted by Ahmad, p. 457.

The CM can be employed "at risk" or "at fee". If employed at risk the CM bears responsibility for the successful delivery of the project and his profit is based on the same principles as the design/build team. If employed at fee he takes on a role as a paid consultant to the owner for a fixed fee not necessarily affected by the success of the project. The CM provides the owner with expert experience and capabilities, in delivery, constructability and value engineering issues. CM typically is most useful on extremely large, complex projects.

The new role that could emerge is similar to the role that the Bechtel/Parsons Brinkerhoff joint venture has taken on the Boston Central Artery/Tunnel Project. Although originally hired by the state as a design and construction manager, B/PB introduced and developed the Partnering strategy as applied to the single-projects in this mega-project. In the future public or private agencies could hire a CM to institute the Partnering concept for their project. This may be most effective if the owner agency is less sophisticated in the construction process. It could even result in a new service 'The Partnering Manager'.

6.2.4 Infrastructure Rehabilitation.

Partnering may play an important role in the rehabilitation of our Nation's infrastructure. Recent National attention has focused on the 200 year old U.S. infrastructure and its ailments. Great problems exist in aging, public owned bridges, roads, water and sewer systems. These structures are worth trillions of dollars and a great percent of

them have fallen below acceptable standards. The process to revitalize and repair this infrastructure will require hundreds of billions of taxpayer dollars over many years. The newly elected administration has identified it's intent to make progress in this area.

With the increasing National debt taxpayer money must be used efficiently and in the public's best interests. The relationship between public and private sector organizations that will be required to rebuild the ailing infrastructure is critical for success. Partnering should play a major role in providing for the needs of our country now and in the future. The application of Partnering has already begun in many key public sector organizations at federal and state levels. As public sector work increases to rehabilitate our Nation, Partnering should play an increasingly important role in insuring the efficiency and success of this endeavor.

6.2.5 Environmental Remediation Projects.

Another major National issue involving the construction industry has been the remediation and restoration of the damaged environment. The effort in the U.S. to identify and clean up hazardous waste sites has increased and promises to be a critical industry for years to come. It is an industry with great complexities, unknowns, risks, bureaucracy and litigiousness. "Hazardous waste remediation work by its nature involves substantial unknowns that make it difficult...To a much greater extent than in facility construction, contracting for

environmental remediation is heavily driven by fear of liability.²⁵² These characteristics have often limited the application of innovative processes for site remediation.

The public sector is regularly responsible for analyzing, inspecting and contracting for the clean-up of these complex problems. These projects pose another key public/private interface where the application of Partnering may assist the process. The use of Partnering on these projects would improve communication of the project complexities between stakeholders. This could result in more clearly defined problems, issues, standards, and risks and could result in a greater sharing of these risks. As in more typical construction projects the Partnering application could produce better applications of innovative and cost effective techniques to the benefit of all involved parties. Partnering could play an important role in this area in the future.

6.2.6 Lessons for the Private Sector.

The public sector has learned many important management concepts and techniques from the private sector and applied them to their advantage. Concepts such as Total Quality Management (TQM), Design/Build and Pure Partnering are just three examples. However, the public sector Single-Project Partnering applications studied here provide additional lessons for the private sector as well.

²⁵²Ness, Andrew, D. "Contracting for Environmental Remediation." *Construction Business Review*, Mar/Apr 92, pp. 70,75.

The public sector model appears to apply to any size project, has proven its worth on single projects and has benefits that could also be used to augment the Pure Partnering model in the private sector. The public sector model offers an important alternative for industries that do not require the large amount of construction typical of organizations who employ Pure Partnering. An element that could benefit Pure Partnering is the workshop that acts to jumpstart the Partnering process. Its use could facilitate team development in the private sector. This application could decrease the time required for companies to feel the benefits of the long-term Partnering process. Due to the reduced restrictions of private sector contracting, elements of the public sector Partnering model could be utilized in even more flexible, innovative and beneficial applications.

The application of Partnering is not limited to the construction industry. The lessons learned on public construction projects can be applied to any industrial relationship. A recent editorial in *Engineer News Record* addressed the productive course set by Partnering.

"Coupled with other innovations in alternative dispute resolution, technology and labor-management cooperation, construction may be well on its way to becoming a role model for other industries."²⁵³

Partnering is another way to improve relationships between clients or within a single company and the concept poses the possibility to realign the values within industry and the Nation.

²⁵³"Partnering Sets Productive Course", ENR Editorials, *Engineer News Record*, Oct 14 1991. p. 64.

6.3 Future Studies.

Partnering is a dynamic, flexible process and as a concept it will continue to develop and provide new lessons. The need to capture this information as well as to develop innovative ideas and alternatives will remain an important issue. There is still a need to study the long-term results of the process in a quantitative manner. Many of the projects presented in this thesis were at early stages of construction. The results of the projects initiated by both the Arizona Department of Transportation and the Massachusetts Highway Department will be important. A close comparison of two similar Partnered and non-partnered projects would provide more details of the Partnering benefits. The Boston Central Artery/Tunnel project provides this opportunity over the long-term.

Case studies of projects that are able to implement Partnering along with any of the recommended improvements would also be beneficial to the industry, skill or resource development; changes to award methods or contract type; use of incentive fees or objective focus sessions; progress of Rolling Partnerships; design/build projects as well as future applications and trends.

6.4 Thesis Conclusion.

In 1986 the Massachusetts Institute of Technology convened a commission to address the decline in U.S. industrial performance. In 1988 The MIT Commission on Industrial Productivity published their findings. While the commission focused their study on industry in general and not specifically on the construction industry their

findings and recommendations are applicable. The commission identified five imperatives to overcome the threat to the U.S. economy. These imperatives were;²⁵⁴

- 1) Focus on the new fundamentals of manufacturing.
- 2) Cultivate a new economic citizenship in the work force.
- 3) Blend cooperation and individualism.
- 4) Learn to live in the world economy.
- 5) Provide for the future.

The Partnering concept applies directly to the third imperative, blend cooperation and individualism. This idea requires industry to reorganize and apply better intra- and interfirm relations. The commission recommended that "...companies should put less emphasis on legalistic and often adversarial contractual agreements, and promote business relationships based on mutual trust and the prospects of continued business transactions over the long-term. Such a shift would not only enhance productive performance but would also help reduce costs."²⁵⁵

This thesis' Analysis of Public Sector Single-Project Partnering has reinforced this imperative. Partnering promotes business relationships, reduces the causes and effects of the adversarial construction relationships, promotes trust, has increased performance and reduced costs. More over it has been accepted by key stakeholders in the public sector construction industry.

²⁵⁴Dertouzos, Michael, L; Lester, Richard, K; Solow, Robert, M. *Made in America, Regaining the Productive Edge*. The MIT Press, Cambridge, MA, 1989. p.132.

²⁵⁵*Ibid*, p. 140.

In a speech at the Massachusetts Institute of Technology Symposium on The Construction Industry in the Northeast: Opportunities for the 21st Century, Mr. James J. Myers, Esq, Partner, Gadsby & Hannah referred to successful Partnering as "A kinky little concept..."²⁵⁶ In reality Partnering is a new application of some age old techniques of teamwork, trust, communication, and commitment. From a Dispute Resolution Systems Analysis the Partnering concept can address the key elements of environment, organization relationships and problem resolution procedures.

The benefits from the application of the U.S. Army Corps of Engineer's Model to projects using the traditional delivery method by the Army, Arizona DOT and Massachusetts Highway Department have been significant. The potential for increased applications throughout the public sector by other federal, state, or local governments, limited by delivery techniques or fixed fee contracts, are great and should be pursued.

Although benefits are readily apparent there is still more potential for improved applications. Partnering doesn't eliminate problems but enhances the ability to solve them. It requires a lot of commitment, effort and skill to make it work as a Dispute Resolution System. A clear understanding of the concept will lead to wider and more efficient applications.

Today the concept is obtaining great support from owners, constructors and designers. The positive discussions of Partnering at

²⁵⁶Myers, 12 May 1992.

the MIT symposium were significant and clearly identify the need for this healthy alternative to grow and spread. At MIT Mr. R. M. Monti, Senior VP Parsons Brinkerhoff Quade & Douglas, Inc stated the need for the industry to support the Corps initiative. He stated the construction industry "...must get behind The Corps of Engineers with their Partnering concept. We must support the Corps, preaching this gospel to public owners. It is the only way we can possibly go. We must embrace it."²⁵⁷

The purpose of this thesis was to provide a detailed analysis of the Partnering process, identifying the need for an alternative in the public sector; defining the process; presenting applications; identifying benefits and barriers; and identifying how and why the concept works or could be improved. The most important analysis must come from those who have participated in the process and can provide insight and coaching to those who want to improve the construction industry. Such an analysis is summarized by a contractor's support of the all gain process, "Partnering takes a lot of effort, yet that effort is paying off. It will lead to lower overall costs, less time for performance, to a quality project built safely with minimum impact to the public. People from both the contractor's and owner's team will be able to look with satisfaction on a good project that was a pleasure to work on."²⁵⁸

²⁵⁷ Monti, R. M. "Megaprojects: Owner's Perspective" Speech given at MIT Symposium on Construction Industry in the Northeast: Opportunities for the 21st Century, 13 May 1992.

²⁵⁸ Geary, p. 743.

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APPENDIX A

The following pages include copies of Partnering Agreements from the Project Case Studies and documents from the Boston Central Artery/Tunnel Project.

Sources of Partnering Agreements at items A1-A4 are as footnoted.

Source of material from the Boston Central Artery/Tunnel project; items A5-A19, were original documents provided by MR Larry S. Bonine, the project Partnering Champion.

The PARTNERING AGREEMENT of the *MS TEAM*
for the OLIVER LOCK & DAM Replacement Project

I. We, the Mobile District Army Corps of Engineers and the Fru Con Corporation are committed to a positive utilization of **TEAMWORK** in the construction and contract administration of this project. We believe that through **TEAMWORK** we will be able to provide a *safe, quality* project completed *on time* and *within budget*.

II. We are committed to the concept of prompt, equitable **PROBLEM SOLVING** recognizing the individual interests and the common goals, such as 120 day cycle time for problem resolution. We firmly believe that by open, trustful and objective communication, our **PROBLEM SOLVING** can be done predominately in anticipation and prevention thereby ensuring the success for all team members. Early identification, open communication along with principled negotiations are the tenets of our **PROBLEM SOLVING** commitment.

III. We believe that this **PARTNERING** commitment will enable all team members to improve and expand their job performance. Further, we are committed to **SHARING AND TRANSFERRING** these partnering characteristics of **TEAM WORK AND PROBLEM SOLVING** with and to all people associated with the **OLIVER LOCK & DAM** Project to enhance their participation and to achieve maximum success in all respects.

<p><i>Leif Carl</i> SAFETY</p> <p><i>Mike M. Koun</i></p> <p><i>James W. Fulk</i> INDIVIDUAL GROWTH</p> <p><i>James J. Cipellere</i> QUALITY</p> <p><i>James H. Harmon</i></p> <p><i>Manfred Lupp</i> CONCUR MANFRED LUPP Chairman and CEO, Fru-Con</p>	<p><i>John W. Bennett</i> ON TIME</p> <p><i>Morris Berk</i></p> <p><i>Normand Wagner</i> WITHIN BUDGET</p> <p><i>James R. Bonine</i></p> <p><i>Larry S. Bonine</i> CONCUR LARRY S. BONINE Colonel, US Army, C of E</p>	<p><i>Michael Kunk</i></p>
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Appendix A1: Oliver Lock and Dam Partnering Agreement. 259

28 February 1989

We agree to communicate and cooperate in all matters affecting the project by developing specific action plans to break down communication barriers, improve work change orders and ensure the construction, instrumentation and follow-on operation and maintenance of the TOCC meets the needs of the Eastern Space and Missile Center.

Lt Phillips *Edgar Mann*
Jerry Valok
CORPS OF ENGINEERS
Jack Skay *Tom Sommer*
Jack W King Jr
CSR

Wendy Lee
AIR FORCE
Aeris Banning
Glen Smith
PAN AM

Don Harris

E. L. Wik

30/11

W & J
William J. ...

Jon L. Schils

John D. Rizzo

[Handwritten signature]

John C. Towell

W. L. McKim

Wayne S. Bullington

Von Knecht

John A. Butner

Joe M. Inman

LAWRENCE L. GOOCH
Colonel, USAF
Commander

260 USACE, Mobile District, Attachment E2.

May 16, 1990

KIEWIT/AL JOHNSON, A JV
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT

We, the Partners for construction of the Bonneville Navigation Lock, commit to trust, cooperation and excellence for the benefit of all stakeholders.

- o Excellence in Safety Performance by completing the Project with the following results:

- a. No fatalities
- b. Lost time incident rate less than 1.0.
- c. No general public liability claims over \$500

Commitment to a quality project by:

- a. Meeting the design intent
- b. Joint quality management program
- c. Building it right the first time

- o Make a commitment to on-time lock opening by:

- a. Timely resolution of issues
- b. Joint management of schedule

Maintain Integrity of Fish Hatchery

- o V.E.J.P. goal of \$100 million total project savings.

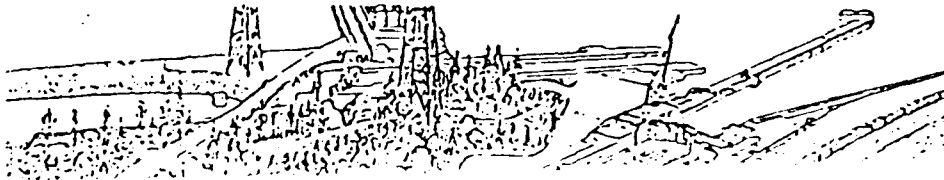
- o No litigation

- o Maximize cooperation to:

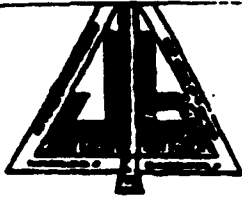
- a. Limit total cost growth to less than 5 percent
- b. Minimize contractor and subcontractor costs
- c. Minimize paperwork

- o Make the project enjoyable through:

- a. Partnering at all levels
- b. Communication
- c. Having fun



Appendix A3: Bonneville Lock Partnering Agreement. 261



THE PARTNERING AGREEMENT OF THE J-6 TEAM FOR THE LARGE ROCKET TEST FACILITY ARNOLD AFB, TN

- I. We, the J-6 Team, are committed to a positive utilization of PARTNERING in the construction and contract administration of this project. We believe that through PARTNERING we will be able to provide a safe, quality, functional project completed on time and within budget.
- II. We are committed to open communications, joint problem solving, and teamwork to accomplish the following goals:
 - A satisfied customer with a quality facility which works.
 - A safe project with zero lost-time accidents.
 - Successful project completion which includes:
 - Contract cost growth limited to 2%
 - Award 100% of the Award Fee
 - Completion within respective budgets
 - Maximizing Value Engineering
 - Completion on or ahead of schedule
 - Total team approach resulting in: Outstanding Project Team Performance.
- III. Our goals will be achieved through a commitment to teamwork and partnering characterized by mutual trust, responsiveness, flexibility and open communication. To accomplish these goals, we, the J-6 Team, commit to project decision-making at the lowest possible level within the Team at the project site.

U.S. ARMY CORPS OF ENGINEERS

EBASCO Constructors, Inc.

CE Services, Inc.

The Ralph M. Parsons Co.

U.S. AIR FORCE SYSTEMS COMMAND

Gust K. Newberg Construction, Co.

DMJM

ATTACHMENT (A)

Appendix A4: J-6 Rocket Test Facility Partnering Agreement. 262



Massachusetts Highway Department
Central Artery/Tunnel

CA/T PARTNERING SESSION - FRIDAY, MAY 15, 1992

AGENDA AND ATTENDEE LIST

0800 - 1000 Team Building Exercises
1000 - 1015 Break
1015 - 1200 Develop goals, objectives and issues
1200 - 1300 Working lunch
1300 - 1400 Identify impacts and issue prioritization
1400 - 1500 Develop action plans
1500 - 1600 Presentations and discussion of action plans
1600 - 1700 Evaluation and closing comments

MHD

Peter Zuk
Stan Durlacher
Bob Albee
Horace Del Grosso
Anthony Battelle
Paul Carr
Tony Ricci
Joe Allegro
John Henderson
Jeff Mullan
Mike Galvin
Larry O'Brien
Maury Tayarani
Miguel Fernandes

B/PR

Don Marshall
Sallye Perrin
Tom Murphy
John Gaudette
K.K. See-Tho
George McCaffery
Joe Peckis
Donald Hessong
Robert Burnett
John Boomer
Tony Lancellotti
Michael Ryan
Stan Haas
Paul Goguen
Marty Sonbolian
Ron Miller
Larry Bonine

YHWD

Donald Hammer
Dan Berman
Alex Almeida

Appendix A5: Central Artery/Tunnel Initial Partnering Session.

PARTNERING

The Department and the Management Consultant intend to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives include; effective and efficient Contract performance; and completion within budget, on schedule, and in accordance with plans and specifications.

This partnership will be bilateral in makeup, and participation will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by both parties and will be shared equally with no change in Contract price. To implement this partnership initiative, it is anticipated that the Contractor's proposed on-site representative and the Departments Authorized Representative will attend a partnership development seminar at the earliest opportunity immediately after award. This will be followed by a team-building workshop to be attended by the Contractor's key on-site staff and Department personnel. Follow-up workshops will be held periodically throughout the duration of the Contract as agreed to by the Contractor and the Authorized Representative.

An integral aspect of partnering is the resolution of issues in a timely, professional and non-adversarial manner. Alternative dispute resolution methodologies will be encouraged in preference to the more formal mechanism of Subsection 7.16 Disputes. These alternatives will assist in promoting and maintaining an amicable working relationship to preserve the partnership. Alternative dispute resolution in this context is intended to be a voluntary, non-binding procedure available for use by the parties to this Contract to resolve any issues that may arise during performance.

C04A2 Partnership

- Owner team

FHWA Area Manager	Greg Doyle
MHD Area Construction Manager	Joe Allergo
B/PB Area Construction Manager	Don Hesson
B/PB Resident Engineer	Marty Sonbolian
B/PB Office Engineer	Michelle Daigle
B/PB Senior Field Engineer	Dan Eagan
B/PB Project Engineer	Ward Kingma
B/PB Area Lead Scheduler	Mike Mix
B/PB Scheduler	Jeanne Packard
B/PB Area Mods and Changes Engr.	Richard Sarles
SDC	Stan Reich, HDR Engr, Inc
B/PB Environmental	Allen Randal
B/PB DBE	Marilyn Ford

- Contractor team

Area Manager	Brian Williams
Project Manager	Mike Huie
Project Engineer	Tom Reddy
General Superintendent	Dave Wiley
Safety Engineer	Drew Graham
Assistant Project/Design Engineer	Jean Abissi
Scheduler	Gus Baker
Kiewit/PAK	John Mc Lenithan

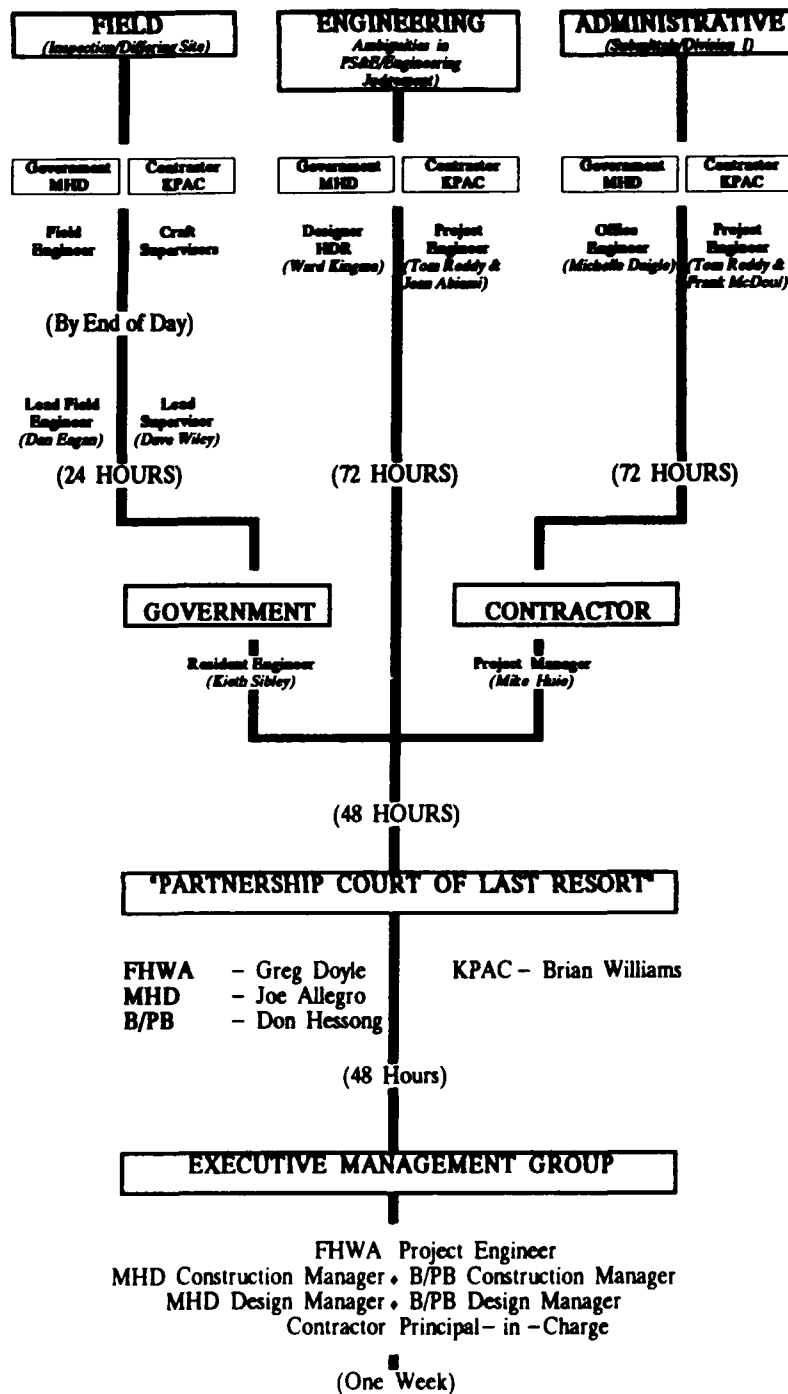
Sub Contractor (to join in progress)

Sub Contractor (to join in progress)

- Ajoining Contracts

C05A1	
- B/PB	TBD
- MKIW	TBD

RESOLUTION OF DISPUTES AND CRITICAL PROBLEMS



Appendix A8: C04A2 Dispute Resolution Model.

Shaw Johnson
F. W. McDermott



PARTNERING AGREEMENT

C04A2 - BMIP

As partners on the C04A2 Project, we are committed to construct this project in a timely fashion and in a safe manner to obtain a quality product built under budget.

We will communicate openly and work together as a professional cohesive team with full co-operation and sensitivity to the community. We will be honest and fair with each other at all times.

J. Padell

As a result, we will complete a successful and functional project that we all can be proud of.

These are our Goals:

- I. Comply with disputes resolution model time lines
- II. Zero disputes beyond court of last resort.
- III. No claims unresolved.
- IV. Safety - Exceed Nation Industry Standards by 20% (exceed Kiewit Standards).
- V. Value Engineering \$2,000,000 (total savings).
- VI. Best efforts at meeting AA/EEO goals.
- VII. Meet or beat milestones.
- VIII. Early notification/discussion of changes.

Days: 1-----60

Action: PCN

to

Agreement

IX. Nurture Partnering

Dan Berman
Project Manager
FHWA

Peter Zuk
Project Director
MHD

Leon Heron
Principal in Charge
Kiewit/PAC

Don Marshall
Project Manager
B/PB

Partnership Evaluation							
Site		Off Site		Contractor		Owner	
Unsat		Sat		Excellent		Evaluation Period	
1		3		5			
Item No.	Item	Weight	Rating	Score	Comments	N/A	
I	Resolution Time Lines	4					
II	Issues to EMG	6					
III	Unresolved Claims	7					
IV	Safety	6					
V	VE Savings/Program	4					
VI	AA/EEO Goals	3					
VII	Schedule	7					
VIII	Communication on Changes	8					
IX	Resolution of Changes	6					
X	Nurturing Partnering	5					
Total Score							

I. Resolution time lines: Are issues being resolved at the lowest level within the timelines set by our model?

II. Issues to Executive Management Group (EMG): Once an issue has been identified that cannot be solved at the lowest level, how well are we following the model? Do we still let the issue flounder get more difficult to solve and cause problems or are we moving the issue up the model for resolution the way we said we would? Have we needed the EMG to resolve an issue? Do you still think the model will work?

III. Unresolved Claims: Are there PCN's hanging that should have been settled more quickly?

IV. Safety: Are we exceeding KIEWIT standards?

V. VE Savings/Program: Have we tried a value engineering proposal and if so how is the process working?

VI. AA/EEO Goals: How are we doing with respect to our goals? Are we doing the best we can?

VII. Schedule: Are we still on schedule for this contract?

VIII. Communications on Changes: Are we talking? Do all Partners feel informed that proposed changes are communicated promptly?

XI. Resolution of Changes: Have we been able to follow the 60 day model from our Partnering agreement?

X. Nurturing Partnering: How is Partnering working? Are we working together to accomplish the goals established at the workshop? Is there a difference?

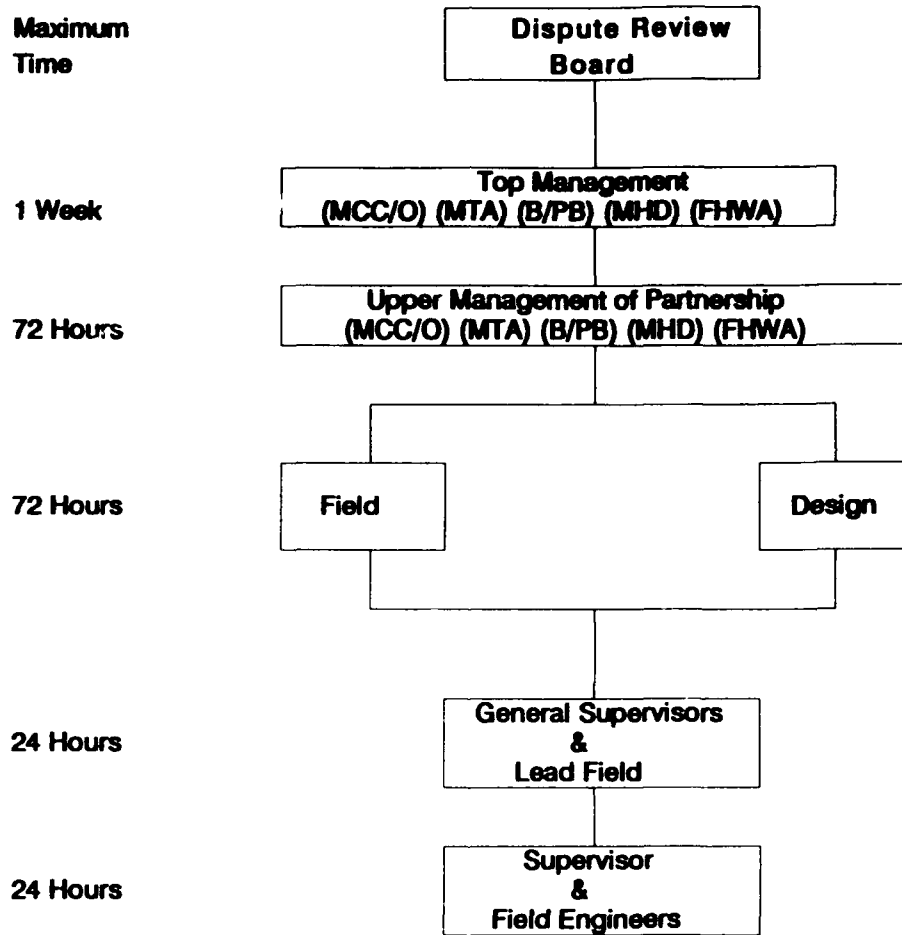
Please enter a score of:

- 1 = unsatisfactory
- 2 = Satisfactory but needs lots of improvement
- 3 = Satisfactory but we can do better
- 4 = Satisfactory
- 5 = Excellent

PARTNERING C07A1 MAILING LIST		
NAME	DUTY	O/C
Allegro, Joe	Area Manager	O - MHD
Bede, Derrell	Claims and Changes	O - B/PB
Corberth, Dave	Field Engineer	O - B/PB
Doctor, Lynne	Office Engineer	O - B/PB
Ford, Marilyn	EEO Officer	O - B/PB
Goguen, Paul	Resident Engineer	O - B/PB
Hessong, Don	Area Manager	O - B/PB
Keane, Bill	Claims and Changes	O - B/PB
Mix, Mike	Lead Schedule Engineer	O - B/PB
Spiller, Philip	Schedule Analyst B/PB	O - B/PB
Taddonio, Mike	Lead Field Engineer	O - B/PB
Tagliaterra, Marty	Project Engineer	O - B/PB
Calawa, Marty	Area Engineer	O - FHWA
Nicholas, Donald	SDC - Gannett Fleming	O - SDC
Niemiec, Stanley	SDC - ENGR Jenny Engineering	O - SDC
Peters, Dave	SDC - Senior Engineer, URS	O - SDC
Silverman, Lyle	Project Manager	O - SDC
Freeman, Joe	Permit Engineer	O - BSC
Leprl, Ron	Construction Coordinator CD M	O - CDM
Anderson, Ken	General Superintendent	C - MCC/OB
Belliveau, Len	Submittal Coordinator	C - MCC/OB
Berry, Bob	Bid Transition	C - MCC/OB
Bruno, Jim	Rebar Coordinator	C - MCC/OB
Coblyn, George	EEO Officer	C - MCC/OB
Griffin, Bob	Mech/Elec Coordinator	C - MCC/OB
Jackson, Rick	Concrete Superintendent	C - MCC/OB
Madden, Charles	Senior VP/Modem Continental	C - MCC/OB
McDonald, Wendell	Superintendent NB - Johnson	C - MCC/OB
McNamara, John	Senior Project Manager	C - MCC/OB
Megason, Frank	Carpenter Superintendent	C - MCC/OB
Mulvey, Lisa	Earth Support Design	C - MCC/OB
O'Dell, Ken	Chief Engineer	C - MCC/OB
O'Neil, Gary	Earth Support Consul, MCPHall Assoc.	C - MCC/OB
Pastore, John	Bid Transition	C - MCC/OB
Peck, Joe	Schedule Engineer MCC/OB	C - MCC/OB
Pio, Ramzi	Asst. Schedule Engineer MCC/OB	C - MCC/OB
Trainor, Ed	Lead Detailer, Barker Steel	C - MCC/OB
Watatani, Akio	Gen. Manager, Obayashi	C - MCC/OB
Yamada, Takeshi	Project Engineer	C - MCC/OB
Himick, Daniel	Vice President	C - NIC
Minihan, John	Project Engineer	C - NIC
Pearlman, Seth	Design Engineer	C - NIC
Uranowski, Daniel	Regional Manager	C - NIC
Hoang, Nhuy	Engineer	A - MP
Kelly, Bob	Massport/Senior Project Manager	A - MP
Pleau, David	Principal Engineer/ICF kaiser Eng Inc.	A - MP
Powers, Larry	Lieutenant, Fire Inspector	A - MP
Sciple, Carl	Asst. Director of Engineering Const.	A - MP
Thatcher, Bruce	Massport/Chief Oper. Shift Manager	A - MP
Tobin, Gary	Asst. Manager/Airport Maintenance	A - MP

Appendix A12: Participants, C07A1 Initial Partnering Workshop.

ISSUE RESOLUTION – C07A1



Appendix A13: C07A1 Dispute Resolution Model.

42. the partners of 807A1, 3 and 3land Glad turned project in order to achieve the common goals of

SAFETY • COST/SCHEDULE • POSITIVE PUBLIC PERCEPTION • QUALITY • COMMUNICATION • IMPACT MITIGATION •

agree to incorporate and maintain in all project activities the partners' core values of

42. the partners of 807A1, 3 and 3land Glad turned project in order to achieve the common goals of

SAFETY • COST/SCHEDULE • POSITIVE PUBLIC PERCEPTION • QUALITY • COMMUNICATION • IMPACT MITIGATION •

agree to incorporate and maintain in all project activities the partners' core values of

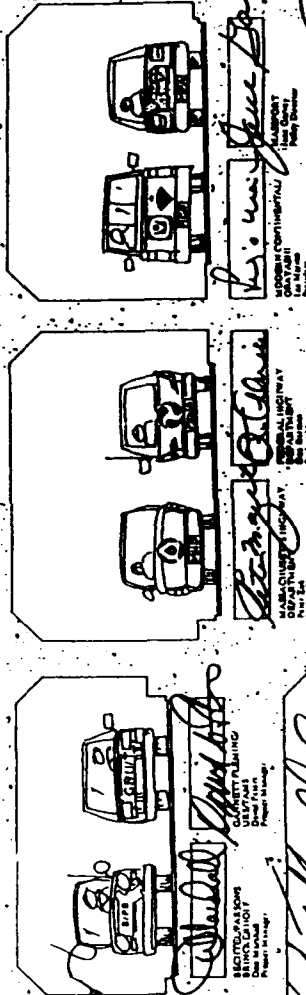
- SAFETY • COST/SCHEDULE • POSITIVE PUBLIC PERCEPTION • QUALITY • COMMUNICATION • IMPACT MITIGATION •
 agree to incorporate and maintain in all project activities the partners' core values of
 • COOPERATION • DEDICATION • FLEXIBILITY • INTEGRITY • PRIDE •

agree to incorporate and maintain in all project activities the partners' core values of

- COOPERATION • DEDICATION • FLEXIBILITY • INTEGRITY • PRIDE •

Through these common goals and core values we will successfully build this project, and in doing so, not only change the face of Boston, but also pave the road to improving our future.

BIRD ISLAND FLATS TUNNEL



Appendix A14: C07A1 Partnering Agreement.

On the _____
 Area & Above _____

July 92 - Present

	Excellent	Adequate	Improve	N/A	Comment
	5	4 – 3	2 – 1		
Submittal/Approval Process					
RFI's					
PCN's					
Disputes/Issue Resolution					
Permit Process					
Daily Individual Communications					
Job/Progress Meetings					
Value Engineering					
Materials Testing					
EEO					
Goals					
Safety					
Quality					
Schedule					
Public Relations					
Third Party Relations					
Management Support					
Values					
Integrity					
Trust					
Communication					
Cooperation					
Flexibility					
Morale					
Respect					
Pride/Enthusiasm					

5 = Working for now
4 = Good now but will need continuous maintenance
3 = OK but could be better
2 = Needs improvement now.
1 = Unsatisfactory, process is broken.

Results of the survey

* PRE-WORKSHOP SURVEYS were similar but in the present tense.

I am with:

Central Artery/Tunnel
Modern Continental/Obiyashi

↓ PRE *

POST-WORKSHOP SURVEY

↓ POST

Based on what I have learned about Partnering and the members of the construction team for C07A1 during the workshop, I now think that:

1. Communication between contractor and owner personnel will be:

1	2	2.65	3	4	4.46	5
difficult, with						Open, Honest
much misunder-						free flowing
standing						
2. Concerns and problems will be acknowledged:

1	2	2.51	3	4	4.41	5
only when they						at first
can't be ignored						
3. Concerns and problems will be:

1	2	2.97	3	4	4.19	5
swept under						dealt with
the rug						quickly & directly
4. Cooperation between owner and contractor personnel will be:

1	2	3	4	4.55	5
non-existent		3.0			characteristic
					of all phases
					of work
5. When issues are raised, our response will be:

1	2	3	3.81	4	4.64	5
extremely slow						prompt &
						responsive
6. When issues are raised, the other guy's response will be:

1	2	2.49	3	4	4.29	5
extremely slow			3.08			prompt &
						responsive
7. When issues are raised, people:

1	2	3	3.08	4	4.41	5
say one thing,						do what they
but do another						say they will do
8. When this project is completed, there will be sense of teamwork between owner and contractor staff that is:

1	2	3	2.80	4	4.52	5
non-existent						strong

I now define a successful project as:

Appendix A16: C07A1 Initial Workshop Survey Document.

EVALUATION: PARTNERING WORKSHOP

PLEASE EVALUATE THE OVERALL EFFECTIVENESS OF THE RETREAT (CIRCLE YOUR CHOICE).

1. 2. 3. 4. (45) 5. Average

INEFFECTIVE **QUITE EFFECTIVE**

WHAT DID YOU PERCEIVE AS THE STRENGTHS (BENEFITS) OF THE RETREAT?

- Meet other "players" on the contract.
- Introduction to group dynamics/interaction.
- Good Facilitators: Interesting, knowledgeable, sense of humor, kept group on track, interested in our problems.
- This provided the opportunity to meet the players involved on a somewhat equal level and that they are not faceless initials or signatures on the reams of paper that become inherent in a job of this magnitude.
- It also gave us the chance to expose everyone's concerns on an informal level well in advance of red tape.
- Building comradery, getting to know the other "side" and important 3rd parties, agreeing on common interest, goals, objectives.
- This workshop got everyone working in the same direction. It allowed everyone to get to know each other in an informal atmosphere.
- The concentrated period of time away from distractions
- The large amount of proactive work generated from only 2 days.
- Familiarization of all partners with one another.
- Some removal of preconceived notions.
- Letting everyone meet, to be able to put a face with a name. Also the exercises helped explain the need for partnering.
- Faster recognition that teamwork can provide better results and services than individuals can create.
- All partners got to know each other in a friendly atmosphere.
- Awareness of concern and goals of each other.

- Not just theory was presented; a focus on action plans, commitments and follow-through.
- A chance to get to know the individuals involved and identify some of the key items of importance of specific groups.
- Learning the players, including your own people. Learning how to bring ideas together to reach common goals.
- Understanding of the other party or parties involved operations and goals.
 - Getting to know each other better.
 - For all parties on all levels to have input in problem solving. Each party has an equal input.
 - Introduction to persons of all concerned.
 - Many good ideas came forward.
 - Principle is great if program works and is continuing.
 - Laid groundwork for spirit of cooperation and openness, between owner/engineer and contractor contrary to the typical adversarial beginnings of many projects.
- Presence of many members of the owner, contractor, third party who are clearly involved in the project, who can and will make it or break it for this project
 - Identifying the incredible commonality of all parties
 - Encouraged interaction created infectious learning experience.
 - Getting the job done.
 - Brings everyone together for a common goal
 - Good introduction services, as well as an establishment of common goals with plans for follow-up.
 - A casual atmosphere, away from phones/disturbances.
 - Clear presentation.
 - The people, the agenda.
 - Building a team.
 - Positive attitude.
 - Getting to know counterparts assigned to this project, as well as gaining mutual trust.

- Getting to know people better and creating a good family atmosphere.
- Bringing different perspectives of the stakeholders together work to a common win/win goal.
- A chance to get to know the individuals involved and identify some of the key items of importance of specific groups.
- Not just theory was presented; but a focus on action plans, commitments and following through.
- Familiarization of all partners with one another. Some removal of preconceived notions.